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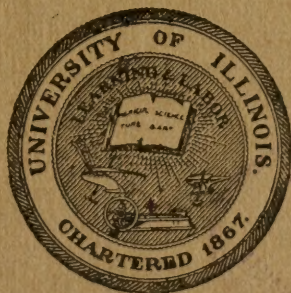
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## UNIVERSITY OF ILLINOIS SCHOOL OF EDUCATION

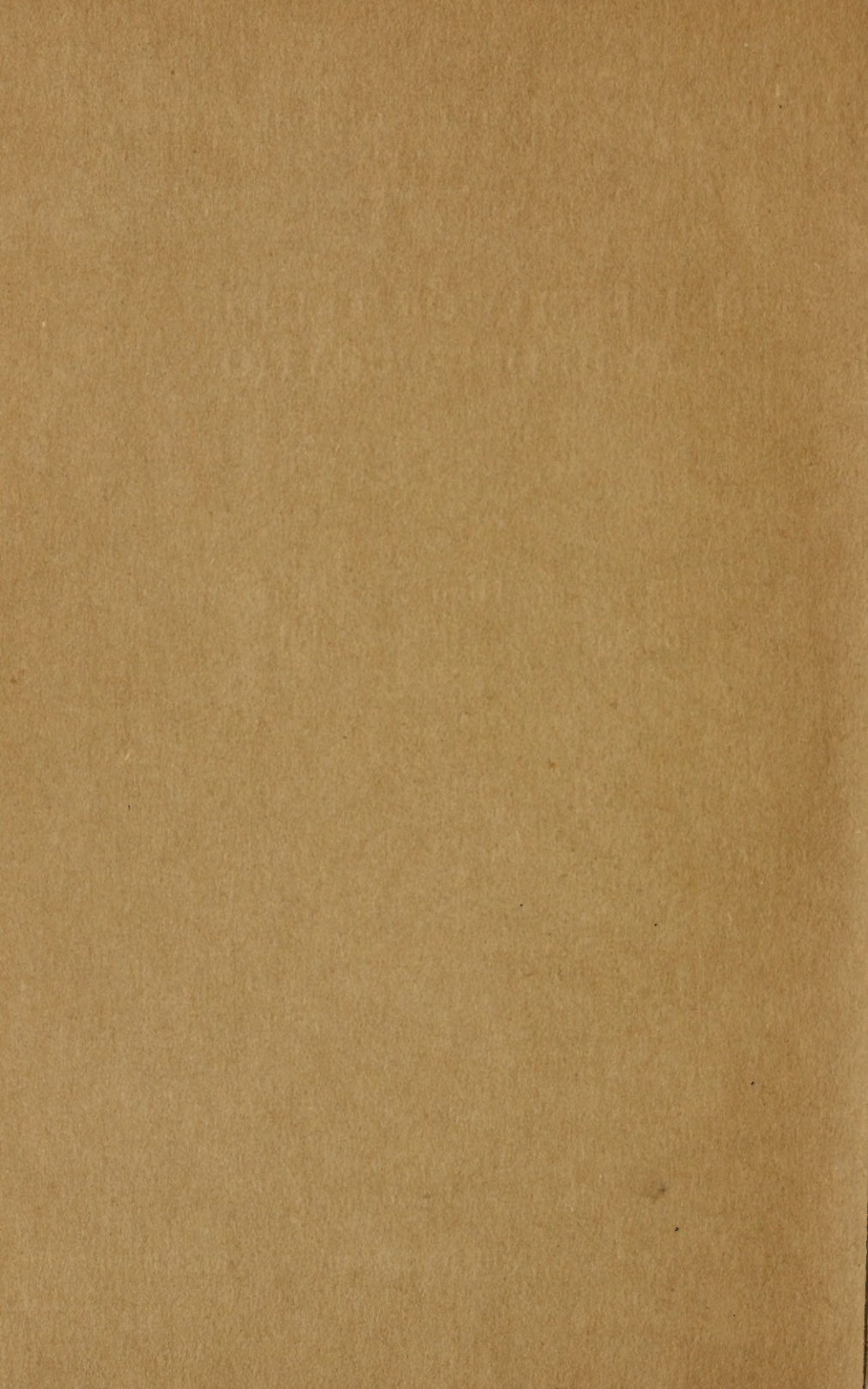
BULLETIN No. 9

Proceedings of the High School Conference  
of November 21, 22, 23, 1912



URBANA, ILLINOIS  
PUBLISHED BY THE UNIVERSITY

The 1913 Conference Will Be November 20, 21, 22



UNIVERSITY OF ILLINOIS  
SCHOOL OF EDUCATION

BULLETIN No. 9

Proceedings of the High School Conference  
of November 21, 22, 23, 1912

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Edited by HORACE A. HOLLISTER

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URBANA, ILLINOIS  
PUBLISHED BY THE UNIVERSITY

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## STATISTICS OF THE CONFERENCE OF 1912.

|   |     |
|---|-----|
| Total registration, exclusive of the University community....                                       | 871 |
| Number of public high schools represented in Conference.....  | 251 |
| Number of representatives of academies.....   | 20  |
| Number of representatives of Normal schools, colleges and uni-<br>versities registered.....         | 51  |
| Number of institutions represented under three and four.....  | 30  |
| Number of county superintendents present.....   | 16  |
| Number of teachers present whose expenses were paid in full by<br>their districts.....              | 147 |
| Number whose expenses where paid in part.....   | 83  |
| Number of high schools represented by delegates whose expenses<br>were paid in full or in part..... | 123 |
| School journals represented.....  | 1   |
| Number from other states.....   | 5   |
| Registration by sections:   |     |
| Administrative.....   | 118 |
| Agricultural.....   | 25  |
| Biology.....  | 50  |
| Classics.....   | 97  |
| Commercial.....   | 27  |
| County Superintendents and Village Principals.....  | 27  |
| Domestic Science.....   | 45  |
| English.....  | 142 |
| Geography.....  | 17  |
| Manual Arts.....  | 29  |
| Mathematics.....  | 80  |
| Modern Language.....  | 36  |
| Music.....  | 40  |
| Physical Sciences.....  | 55  |
| Social Sciences.....  | 56  |
| Number by whom no section was given.....  | 27  |
| <hr/>   |     |
| Total.....  | 871 |

## CONFERENCE COMMITTEES, 1912-13.

**General Conference Committee:** H. A. Hollister, University, Chairman; B. H. Bode, University; H. L. Rietz, University; W. C. Bagley, University; A. P. Johnson, Urbana; W. W. Earnest, Champaign; C. P. Briggs, Rockford; T. W. Galloway, Decatur; H. V. Canter, University; M. H. Robinson, University; Helena M. Pincomb, University; J. M. Clapp, Lake Forest; J. L. Rich, University; E. J. Lake, University; E. B. Lytle, University; Augusta Krieger, Decatur; Constance Barlow-Smith, University; C. H. Elliott, Carbondale; Silas Echols, Mt. Vernon.

The first six named constitute the executive committee.

M. L. Flaningam, Urbana, General Secretary of the Conference.

**Committee on Program of Studies and Interrelationship between elementary schools and high schools:** W. C. Bagley, University, Chairman; C. H. Elliott, Carbondale; E. A. Turner, Normal; J. G. Moore, Streator; H. B. Wilson, Decatur; C. E. Lawyer, East Aurora; H. E. Brown, Kenilworth.

**Administrative Section:** C. P. Briggs, Rockford, Chairman; A. P. Johnson, Urbana; H. H. Edmunds, Clinton; M. L. Test, Mt. Sterling; J. F. Wiley, Mattoon.

**Agricultural Section:** A. C. Norris, Rockford, Chairman; G. W. Sutton, Oakland; S. H. Dadisman, Rollo; E. B. Collett, DeKalb; A. W. Nolan, University, Secretary.

**Biology Section:** T. W. Galloway, Decatur, Chairman; Guy L. Koons, Murphysboro; W. W. Whitney, Chicago; O. W. Caldwell, University of Chicago; Faith McAuley, St. Charles; T. L. Hankinson, Charleston, Secretary.

**Classics Section:** H. V. Canter, University, Chairman; C. E. Allen, Carbondale; Frances Sabin, Oak Park Township High School; Mary L. English, Decatur, Secretary.

**Commercial Section:** M. H. Robinson, University, Chairman; Jay A. Ford, DeKalb Township High School; E. L. Boyer, Chicago Heights; Charlotte VanderNeen, Joliet Township High School; John A. Haight, Rockford.

**County Superintendents' and Village Principals' Section:** B. C. Moore, Bloomington, Chairman; F. A. Gilbreath, Watseka, Secretary.

- Domestic Science Section: Helena M. Pincomb, University, Chairman; Helen Day, Peoria; Isabel Bevier, University; Henrietta Bowman, Charleston; Carrie Galt, Springfield.
- English Section: J. M. Clapp, Lake Forest University, Chairman; Laura Tanner, Jacksonville; Florence Skeffington, Charleston; Eva Mitchell, Centralia; L. S. Lyon, Joliet; H. W. Shryock, Carbondale; H. G. Paul, University; W. F. Mozier, Ottawa.
- Geography Section: J. L. Rich, University, Chairman; D. C. Ridgely, Normal; F. W. Cox, Lawrenceville; Harry Clem, Chicago; Annie L. Weller, Charleston.
- Manual Arts Section: E. J. Lake, University, Chairman; A. P. Laughlin, Peoria; Clara E. Ela, Normal; Anna G. Brown, Jacksonville.
- Mathematics Section: E. B. Lytle, University, Chairman; C. A. Pettersen, Chicago; E. H. Taylor, Charleston.
- Modern Language Section: Augusta Krieger, Decatur, Chairman; D. H. Carnahan, University; W. W. Earnest, Champaign.
- Music Section: Constance Barlow-Smith, University, Chairman; Sallie J. McCall, Urbana; C. E. Lawyer, East Aurora; M. L. Test, Mt. Sterling; Margaret M. Salisbury, Chicago.
- Physical Science Section: C. H. Elliott, Carbondale, Chairman; F. R. Watson, University; H. B. Loomis, Chicago; H. G. Schmidt, Belleville.
- Social Science Section: Silas Echols, Mt. Vernon, Chairman; Mary F. Childs, Evanston; U. S. Parker, Quincy; L. A. Fulwider, Freeport, L. M. Larson, University, Secretary.
- Committee on High School Libraries: P. L. Windsor, Librarian, University, Chairman; Ada Stuart, Peoria; Elizabeth McKnight, Joliet.

## EDITORIAL COMMENT.

In presenting these proceedings of the Conference for 1912, the editor is keenly alive to the inadequacy of the editorial work. An organization presenting such a wide diversity of work and interests as that represented in the fourteen sectional groups, not to mention the work of the general sessions, does not leave a simple task for the one who must undertake to organize and unify the results of such a range of deliberations.

When this problem is further complicated by the difficulties experienced in getting the minutes, papers and reports together, one must needs beg the indulgence of those who may make use of the materials here presented, for any seeming carelessness, either as to selections and omissions, or as to arrangement.

Permit a special comment on what should be a basis for our emulation in organizing future work for the different departments. Papers presented from year to year, no matter how good and worthy in themselves, will not enable us to gain headway very fast in the solution of the many problems awaiting us. On the other hand, those sections which are persistently following up lines of work from year to year, coming back to review results, to revise and improve, are making definite headway. These are the groups which are setting the pace for a new era among educational gatherings.

It seems necessary at this time that we should speak of the financial policy of the general committee, especially as it concerns payment of expenses in carrying out the various programs. One of the chief functions of the conference is the establishment of standards for the high school work of the state. For this reason it has been felt that it is but just that any special effort in this direction, such as carrying on an investigation and writing up a report of the results, or carefully preparing a paper as a contribution to the discussion of some problem before the Conference, should receive some recognition as service rendered. In such cases the necessary railroad fares are to be paid, and reimbursements made for such items of expense as postage, stationery, clerical hire, telegraph and telephone tolls, etc.

At the same time it is necessary to bear in mind such matters as the printing of syllabuses, and of the proceedings, which must come

out of the funds provided for carrying on this work. Hence this opportunity is taken to ask for the co-operation of all interested in the success of these conferences in keeping the incidental expenses of the program as low as may be consistently with efficient work.

Attention is called to the new committee on program of studies and interrelationships between high school and elementary work. Among other things, this committee will consider the recommendations of the sections affecting the curriculum in any way with reference to their probable effect on the program of studies as a whole. Any discrepancies thus noted will be reported back, from time to time, with recommendations. Such a committee can not fail to be very useful in helping toward that unification of our work which must be accomplished in order to render the things proposed practicable. How else may we hope to accomplish results that will be heeded and put into practice in the high schools of the State? The reorganization and more specific designation of the work of this committee comes from a recent meeting of the general conference committee.

## PART I.

### GENERAL SESSIONS.

The first general session assembled in Morrow Hall at 7:30 P. M., Thursday, Nov. 21, as announced. The High School Visitor presided at this meeting, and spoke briefly at the opening on the character and significance of the conference. The substance of his remarks is as follows:

"On behalf of the general conference committee, I desire to express our appreciation of the fine spirit of co-operation which has been manifested by all having to do with the work of these conferences. There is some significance in the growth which this meeting has had. We began seven years ago with an attendance of about 75. Last year there were over 800 in attendance, with 268 high schools represented. Surely this is a representative body. There is no other educational gathering in the state so truly representative of definite educational interests. Such a body is competent to decide or to recommend in regard to all matters of importance having to do with the further development of high schools in Illinois.

The chief function of this conference is that of a standardizing agency. It is unique in this as representing a co-operative plan of standardizing high schools. The chief advantages of such a plan are: (1) It gives opportunity for the hearing of all sides. (2) It makes it easy to put disputed points to the test from year to year, and thus to discover the true basis for revision where revision is found to be necessary. (3) It tends to keep all the teachers awake to the interests of the schools, thus guarding against a narrow formalism in our standards.

There are, however, certain fundamental conditions requisite to the success of such an undertaking. Among these are: (1) Full and free discussion of all issues presented and a frank expression of opinions. If anyone differs from a course of action proposed, and does not voice that difference, he is, in a way, culpable. Especially is this true if he goes out of the meeting complaining that there has not been a fair deal. Of course there will be differences. The point is to discover grounds for agreement as a basis for establishing a working standard.

(2) A willingness to abide by decisions of the majority as such a basis for immediate action.

(3) A willingness to accept and apply standards when once adopted. At least to apply them in spirit.

Perhaps the most significant feature in the plan of organization of this High School Conference is that of having permanently organized committees in charge of the work of the sections. These committees are vested with full authority to plan and direct the work of their respective sessions, not only at the time of meeting, but throughout the intervening year. This makes it possible to organize and conduct a series of investigations from year to year for the clearing up of any problem related to a given phase of high school work, all of which are now represented in these committees or in committees of the general conference."

These opening remarks were followed by the reading of a paper on the California System of High-School Support, prepared by Dr. E. P. Cubberley of Leland-Stanford University. As Dr. Cubberley could not be present the paper was read, very effectively, by Dr. L. D. Coffman of the University. Dr. Cubberley's paper follows:

#### The California System of High School Support.

By Ellwood P. Cubberley,

Professor of Education, Leland Stanford, Jr., University.

The present plan for the support of high schools in California has been an evolution, and is perhaps best understood if first considered historically.

##### 1. *Historical Development of the Present Plan.*

The early school laws of California had permitted of the establishment of high schools, under rather restricted conditions, and the first had been established in San Francisco as early as 1858. A second was established in the capital city, Sacramento, shortly afterward, but the high school movement amounted to little during the first four decades of the state's educational history. By 1879, when the new state constitution was formed, only about half a dozen high schools had been formed in the state. This constitution contained, in the article on Education, what was then and still remains a somewhat unique provision. Its insertion was due to certain peculiar political conditions at that time existing in the state, but the wisdom of the provision has since been shown in ways not then intended. This peculiar constitutional provision was one which included high schools as a part of a possible state school system, but forbade the use of any part of the income from the state school funds or the state school tax, provided for in the constitution, for any other purpose than the payment of the salaries of teachers in the primary and grammar schools. The intent of the provision was to force the support of high schools wholly onto those communities which felt that they could afford such luxuries, and for the next two decades this provision helped materially to prevent the development of high schools in the state. The ultimate result, though, has been good, as I shall point out further on.

This constitution was framed in 1879. The growth of the state was slow for some years following, and this slow growth, coupled with this peculiar constitutional

prohibition, prevented the development of anything but the elementary school system. By 1885, when the state had come to have a million of people, but twelve high schools were in existence within the state. By 1890, when the population had increased to a million and a quarter, the number of high schools had increased to but twenty-four. Only about this number of cities and towns were large enough to maintain a high school, alone and unaided.

In 1891 the first law looking to a better development of high schools in the state was enacted. This was the so-called union-high-school law, under the terms of which two or more contiguous common-school districts might vote to unite to form a union-high-school district for the purpose of maintaining a high school. Similarly, all of the districts of a county might vote to unite to maintain a county high school, or, if more convenient, districts in two counties might vote to form a joint-union high school. This legislation opened the way for the union high school, by permitting a larger taxing unit and more children of high-school age, and a number of union-high schools were soon formed. Within four years after the passage of the law, that is by 1895, the number of high schools in the state had increased from twenty-four to ninety-eight. In the second four years following the enactment of this law, however, the number only increased from ninety-eight to one hundred and eighteen. In 1900 there were one hundred and twenty, and in 1901 there were one hundred and twenty-six. Again, the development had about ceased, because the number of unions which could afford a high school had about been covered. Many other possible combinations could be pointed out where there were enough children of proper age to maintain a high school, but few of these had at the same time enough taxable wealth to warrant the maintenance of such a school. Until wealth and population increased, then, there could be little further development of high schools in California under this plan of local maintenance, and even the expansion of existing schools was almost at a standstill. One thing the peculiar constitutional provision of 1879 now did, and that was to keep up the standard of elementary education in the state. These schools remained good, with relatively good salaries to the teachers, because communities were prevented from cutting down the quality of the education provided for the little children in order to provide high school education for the older ones.

By 1900 the problem of the maintenance of the high schools of the state was under somewhat general discussion. Many communities were desirous of obtaining such advantages for their children, but the heavy burden of support made this impossible. Other communities which had organized high schools under the single-district plan, or under the union-high-school laws, were finding the burden of support almost unbearable, while a few had voted to give up their high school organization and to abandon their high schools. About this time a number of men in California, interested in the further development of secondary education, began to study the problem of support. The chief wealth of California at that time was, and still is to a great degree, in the few large cities of the state, and these were able to maintain their high schools with ease, and to offer broad courses of instruction. San Francisco, for example, was able to maintain five high schools, of different types, on a tax of about four cents on the hundred dollars of assessed valuation; smaller cities, such as San Diego or Santa Barbara, on from eighteen to twenty-five cents; while many small towns or rural union-high-school districts were levying taxes of from sixty cents to a dollar and a quarter for their high schools alone. The great inequality of these rates, especially when compared with the relatively even rates for the maintenance of the elementary school system, due to large general state taxation and a wise system of distribution, naturally awakened inquiry and criticism.

That the state should grant some form of general aid for high schools, as well as for elementary schools on the one hand and the state university on the other, soon became generally evident, as did also the further fact that no such general aid could be provided for so long as the state constitution remained as it had been written in 1879. The first thing to do, then, was to amend the state constitution. In doing this, though, there was no desire to raid the common school fund and tax to provide maintenance for high schools, for it was seen equally well by this time that the fact that this had been prevented by the constitution had been of the greatest value in

the development of the common schools of the state. What was needed was constitutional permission to levy an additional special tax for high schools only, and permission to do this, it was at once recognized, could not be obtained unless the safety of the common school fund was first guaranteed.

An amendment to the state constitution providing for this was accordingly drawn up, submitted to the legislature of 1901, by them in turn submitted to the people, and approved by popular vote in 1902. In 1903 the legislature accordingly levied the first general tax for high schools in the history of the state—a tax separate and distinct from, and in addition to, that previously levied for elementary education. A new era in the development of high schools in California was now begun. When the constitutional amendment was adopted in 1902, there were one hundred and thirty-nine high schools, of all kinds, within the state; in 1912, there were two hundred and twenty-nine. All of these were four-year high schools, and from ten to fourteen new four-year high schools are being added each year.

## *2. The Support of High Schools.*

There may be said to be four main forms in use for extending aid to high schools—the fixed appropriation, the fixed subsidy, the fixed rate of property tax, and an automatically variable rate of tax based on some variable school item. Under the first, that of the fixed appropriation, the legislature appropriates a fixed sum, say \$200,000, to be distributed annually to existing high schools. This is one of the poorest methods of extending aid either to high or to elementary schools, for the reason that the sum biennially appropriated is likely to remain fixed for a long time, and to bear little or no relation to the increasing needs of the schools. The second, or subsidy method, if the subsidy is a guaranteed sum and to be paid in full, regardless of the number of schools qualifying, is a better plan, because it grants a fixed amount to each school, which schools can definitely count on. In practice, however, subsidies are usually covered by a fixed legislative appropriation, which tends to expand altogether too slowly, with the result that the subsidies offered are usually scaled down and paid subject to a necessary discount, due to the rapidly increasing number of high schools. This gives to such subsidy plans all of the disadvantages of the fixed appropriation plan. California has never tried either of these plans, but instead began with the third plan, viz., that of a fixed and general state tax, levied for high schools alone. At first this was fixed at one and one-half cents on the one hundred dollars of assessed valuation of the property of the state, and so remained for four years. The sum produced was found to be approximately fifteen dollars for each pupil in average daily attendance at the high schools of the state, though a somewhat variable amount, and at the legislature of 1907, when conditions were good throughout the state, this tax was shifted to the fourth plan for state aid, and the State Comptroller was ordered to levy, annually, a tax on the property of the state which would produce the sum of fifteen dollars for each pupil in average daily attendance the preceding year, the rate of tax to be whatever might be necessary to produce this sum. This fourth plan is, in my judgment, the best basis for levying school taxes which we have so far devised. It is directly related to the educational needs; automatically increases or decreases as needs increase or decrease; and automatically expands as the state grows in people, the high school grows in partonage, or the system of education is extended to include a larger length or breadth of instruction, and without relation to legislative appropriations or assessed valuations. In good times or in bad times, in economy years as well as in prodigal years, the tax produced for schools remains a constant, and directly related to the number of pupils for whom the schools provide. If it is at any time felt that more money for support is necessary, due to increasing salaries and the general cost of providing education, it is only necessary to present the facts and ask the legislature to raise the rate per pupil.

The value of such an automatically expanding tax will be seen when it is stated that in the past ten years, since the tax for high schools was first instituted, the assessed wealth of the state has increased 115%, the number of high schools has increased 68%, the number of high school teachers has increased 305%, the number of high school pupils has increased 316%, and the expenditures for high schools have increased 410%. To illustrate further, there were in average daily attendance in the high schools of the state of California last year (1911-12) 38,181 students. The

total state tax to be levied for the support of high schools must therefore be  $15 \times 38,181$ , or \$572,715. As all state income is now (since 1911) derived from corporation taxes, it is only necessary for the State Comptroller to set aside this sum from the state corporation taxes, as received, and report it to the State Superintendent of Public Instruction for apportionment. After the state aid has been received, all other money needed is raised by local taxation on the district maintaining the high school.

### 3. *The Apportionment Plan Used.*

The plan for the apportionment of the state aid to the different high schools of the state, now in use, is the one which was instituted when the plan of state aid was first begun ten years ago. It has some very commendable features, as well as some defects. These I shall try to point out. The plan of apportionment is a combination plan, using the school and the daily attendance as units, and it is intended to extend a larger degree of aid to the small school than to the large one. In this it is very successful. The total sum to be apportioned each year is divided into two portions of one-third and two-thirds respectively. The one-third portion is then divided among the approved high schools of the state equally, and without regard to size, while the two-thirds portion is distributed to the different high schools in proportion to the average daily attendance in each the preceding year.

To illustrate, the total amount for apportionment in 1911-12 was \$526,265.21. This divides into two sums of \$175,421.74 ( $\frac{1}{3}$ ) and \$350,843.47 ( $\frac{2}{3}$ ). There were 221 four-year high schools in the state entitled to receive aid. Taking the one-third sum and dividing by 221 gives a school unit apportionment of \$794.78, which amount was given to each approved high school in the state, regardless of size, number of teachers employed, pupils in attendance, or cost of maintenance. Each high school maintained counts for this unit apportionment. The city of Oakland thus received apportionments for three high schools, San Francisco for seven schools, and Los Angeles for eight schools, such being the number maintained by each. The large and the small schools, though, receive the same amount, a school of twenty pupils in average daily attendance receiving the same amount as a school having one thousand. The remaining two-thirds portion is now apportioned to each approved school in proportion to its average daily attendance the preceding year. The average daily attendance in all of the approved schools of the state the preceding year was 35,117. Dividing, this gives an attendance grant of \$9.99 to each school for each pupil in average daily attendance. The grant to each school from the two-thirds portion naturally varies in proportion to its size, a school of one thousand pupils receiving fifty times as large a grant as a school of twenty.

The way this apportionment plan works out may be seen from two tables, which I have compiled. The first gives the details of the apportionment for each year since the passage of the law. The advantage of the change in the method of levying the high school tax, made in 1906, is apparent from this table.

*Table I. Apportionment Plan, for a Series of Years.*

| Year.        | Total<br>sum ap-<br>portioned. | App'd<br>schools. | Av. Daily<br>Att. | School<br>unit<br>sum. | Av. Daily<br>att.<br>grant. |
|--------------|--------------------------------|-------------------|-------------------|------------------------|-----------------------------|
|              |                                | Preceding Year.   |                   |                        |                             |
| 1902-03..... | \$231,392.62                   | 143               | 13,860            | \$544.93               | \$11.28                     |
| 1903-04..... | 167,311.48                     | 151               | 16,709            | 511.45                 | 9.23                        |
| 1904-05..... | 255,248.56                     | 158               | 18,876            | 512.68                 | 8.57                        |
| 1905-06..... | 210,570.20                     | 167               | 20,430            | 473.61                 | 7.72                        |
| 1906-07..... | *240,950.19                    | 171               | 21,209            | 456.99                 | 7.26                        |
| 1907-08..... | 307,169.65                     | 179               | 22,333            | 652.28                 | 10.50                       |
| 1908-09..... | 333,531.08                     | 187               | 25,314            | 639.90                 | 9.37                        |
| 1909-10..... | 382,687.99                     | 197               | 27,470            | 660.50                 | 9.46                        |
| 1910-11..... | 391,177.30                     | 212               | 30,893            | 596.89                 | 8.18                        |
| 1911-12..... | 526,265.21                     | 221               | 35,117            | 794.78                 | 9.99                        |

\*The new plan for levying the high-school tax went into effect here.

The second table shows how a series of high schools of different size fared under last year's (1911-12) apportionment of state aid.

*Table II. Grants made to Schools of Different Size (1911-12).*

| Average Daily Attendance at School. | School-unit Grant @ \$794.98 | Average Daily Attendance Grant @ \$9.99 | Total Grant Received. | Value of Grant per Pupil in Average Daily Attendance. |
|-------------------------------------|------------------------------|---|-----------------------|---|
| 20                                  | 794.78                       | \$ 199.80                               | \$ 994.58             | \$49.72   |
| 30                                  | 794.78                       | 299.70                                  | 1,094.58              | 36.48   |
| 40                                  | 794.78                       | 399.60                                  | 1,194.38              | 29.86   |
| 50                                  | 794.78                       | 499.50                                  | 1,294.28              | 25.88   |
| 60                                  | 794.78                       | 599.40                                  | 1,394.18              | 23.23   |
| 70                                  | 794.78                       | 699.30                                  | 1,494.08              | 21.34   |
| 80                                  | 794.78                       | 799.20                                  | 1,593.98              | 19.92   |
| 90                                  | 794.78                       | 899.10                                  | 1,693.88              | 18.82   |
| 100                                 | 794.78                       | 999.00                                  | 1,793.78              | 17.93   |
| 150                                 | 794.78                       | 1,498.00                                | 2,293.28              | 15.28   |
| 200                                 | 794.78                       | 1,998.00                                | 2,792.78              | 13.96   |
| 300                                 | 794.78                       | 2,997.00                                | 3,791.78              | 12.64   |
| 400                                 | 794.78                       | 3,996.00                                | 4,790.78              | 11.97   |
| 500                                 | 794.78                       | 4,995.00                                | 5,789.78              | 11.58   |
| 750                                 | 794.78                       | 7,592.50                                | 8,387.38              | 11.18   |
| 1,000                               | 794.78                       | 9,990.00                                | 10,784.78             | 10.78   |
| 1,500                               | 794.78                       | 14,985.00                               | 15,779.78             | 10.52   |

This second table shows how distinctly the apportionment plan in use favors the small school. It is the school of twenty to thirty pupils in average daily attendance which receives the largest aid; from thirty to seventy the drop in values is less rapid; while after we reach two hundred the value of the grant reaches a small and somewhat stationary figure, decreasing thereafter very slowly. The advantages of such an apportionment plan are evident. The small school, in a new community, is aided to establish itself and is sustained to a larger degree during the years when the community is small and is learning to appreciate its value, and the establishment of small high schools in rural union districts is accordingly encouraged. The larger the community supporting the school, and of this the average daily attendance is a measure, the larger in general is the assessable wealth for its maintenance. This is usually true not only actually, but relatively as well, as it is well known that the assessable wealth behind each pupil in average daily attendance tends to increase in proportion to the increase in the average daily attendance itself. In other words, the larger the community grows the larger is the wealth behind each pupil in attendance at the school.

Each community must now raise enough additional money to properly maintain its high school, and the larger the community the easier this is to do. This local tax for further support is levied by the school board having charge of the high school. The high school board, which is the city board of education in cities, the town board of school trustees in towns, the county board of education in the case of county high schools, or a representative board composed of one trustee from each district in the case of union high schools, meets and determines the amount of money needed for the maintenance of the high school the ensuing year, over and above that which it is expected will be received from the state. There are no limits to the amount of tax which must or may be raised for the maintenance of high school, and the tax determined upon by the board is not subject to review by either the city or town council on the board of county supervisors. The county supervisors must levy on the property of each high school district a rate of tax for high school maintenance which will produce the sum certified to them by the board of trustees for the school,

and this money, when collected, can be used for no other purpose than high school maintenance. The rate at present levied is approximately three and one-half cents on the hundred dollars for the seven high schools in San Francisco; eleven cents for the eight high schools in Los Angeles; six to eleven cents for county high schools; fifteen to twenty cents for high schools in cities of from fifteen to forty thousand inhabitants; twenty to fifty cents in single districts, and in small cities; and from fifteen to forty cents in union and joint-union districts. The average for all of the high schools of the state is about twenty-eight cents on the hundred dollars, based on a fifty to sixty per cent valuation.

The effect of this legislation in stimulating the development of high schools may be seen from the following table:

*Table III. Twelve-Year Development of High Schools in California.*

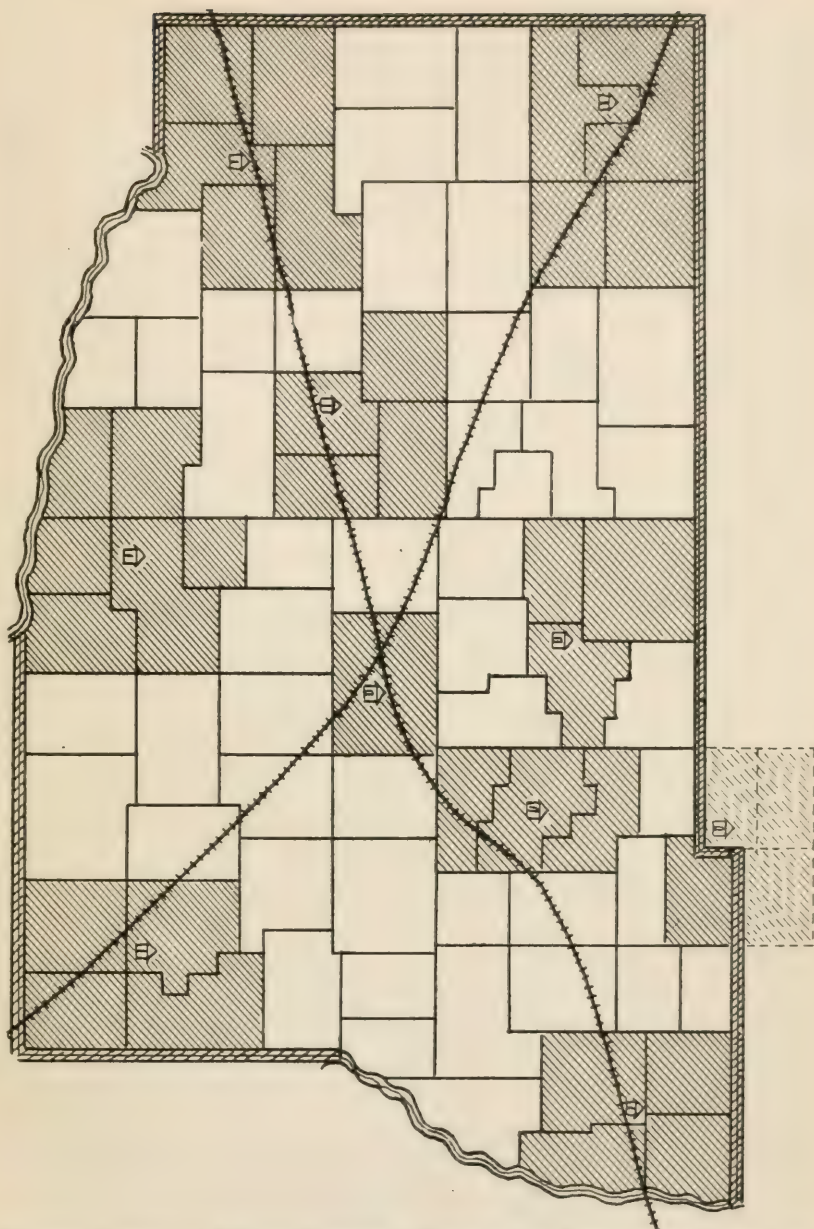
| Type of High School  | 1900 | 1902 | 1904 | 1906 | 1908 | 1910 | 1912 |
|----------------------|------|------|------|------|------|------|------|
| County-Union.....    | 6    | 9    | 12   | 15   | 15   | 18   | 20   |
| City-District.....   | 24   | 29   | 39   | 39   | 38   | 38   | 44   |
| Single-District..... | 35   | 34   | 33   | 33   | 33   | 41   | 41   |
| Union-District.....  | 52   | 57   | 73   | 84   | 94   | 107  | 111  |
| Joint-Union.....     | 3    | 10   | 10   | 12   | 7    | 10   | 13   |
| Totals.....          | 120  | 139  | 167  | 183  | 187  | 214  | 229  |

It will be seen from the above table that the chief development during the period has taken place in the union type of high school. These are usually located in some village, which forms the center of the union, and are the class of schools most in need of state aid.

#### *4. Non-High-School-District Pupils.*

Where a county high school exists, all children in the county naturally have the privilege of attending the county high school free of tuition charges. Where only the other type of high school exists, it will in nearly all cases happen that some high school pupils will live in common-school districts which have not as yet been included in any high school district. This will be seen from the accompanying map (Page 17). This shows a county containing eighty-two common school districts. About half of these have been formed into union high-school districts, while the others are not a part of any high school organization. The conditions shown on this map might exist in any fairly well populated county. The problem of what to do with the children of high-school age in these non-high-school districts soon began to be discussed, and the State Superintendent of Public Instruction early ruled that such could not be charged a rate of high-school tuition higher than the difference between the actual cost of instruction and the per-capita value of the apportionment received from the state. The remaining charge, though, fell on the parents of these children, and it was felt to be somewhat of an anomaly to levy a general state tax for high schools, provide free and state-aided instruction for some children, and then charge others a tuition fee.

It was at first proposed forcibly to annex all non high-school territory to adjacent high-school districts for taxing purposes and free tuition, but such action would compel all children in the territory annexed to any school to attend that particular school, regardless of convenience of attendance or the suitability of the instruction offered therein to meet the individual needs of the pupils. Finally, in 1909, the problem of caring for all such tuition pupils was solved by the enactment of a very ingenious law. The county was made the unit for providing such non-resident pupils with high-school tuition. Any properly qualified pupil, not residing in an elementary school district which is also included in some high-school district, was permitted to attend any high school in the county which he might wish to attend, or, on agreement with the two county superintendents of schools, any high school in an adjacent county. High schools must receive such pupils free of tuition, and annually report the number of such to the county superintendent of schools, together with the actual cost for maintenance for each pupil in average daily attendance in the school, and also the net cost, after deducting the state aid received.



A County Containing 82 School Districts. High School Districts and Union Districts, Shaded; Non-High-School Territory, White.  
 One joint-district, one single-district, and eight union-district schools shown on map.

The county superintendent of schools then totals these figures for all of the high schools within his county, and for any high schools in other counties reporting to him, and where pupils have been permitted to attend, and then notifies the board of county supervisors of his county of the total amount of money needed to repay all such high schools the money they have expended in providing free high-school tuition for non-resident pupils the preceding year. The board of supervisors must then levy a tax on all property located in non-high-school territory in the county sufficient to raise the sum so certified. When such tax has been collected, the county superintendent pays each high-school district the amount it has expended in the education of non-residents.

By this simple law, every child in the state of California is now provided with free high-school education, the educational system at last being free—from the kindergarten continuously to and through the state university. The spreading of the tax for non-residents over all non-high-school territory in the county, instead of making each rural common-school district pay for the children it sends, is a very distinct advantage, as it pools the burden over the county as a whole instead of concentrating it on single districts. It not only results in a greater equalization of the burden and greater uniformity of the tax from year to year, but it also removes from all districts any tendency to put obstacles in the way of their children attending high schools, and for the purpose of reducing the cost to themselves. In the county in which I live, about one-third of which is included in the eight high-school districts of the county, the annual county tax for the high-school tuition of non-resident pupils is about three cents on the hundred dollars of non-high-school district property. This is a very light tax for so large a benefit.

##### 5. *Defects in the California Plan.*

The advantages of the California plan for state aid to high schools are evident, I think. With one-half of the wealth of the state concentrated about two large cities, and with the public utilities, which are now taxed for state support, found only in a part of the counties, the general taxation plan is of material aid to the poorer, less populous and more remote communities. It tends to level up education throughout the state, instead of stratifying it. With the apportionment of the aid based, one-third on the school as a unit and two-thirds on the average daily attendance, greater aid naturally is given to the small school; and payments to all are based on the school as a unit and on the average attendance each day at the school, instead of on any such fictitious item as the number of children reported as of school age. The plan for providing free tuition for all high-school pupils in the state is particularly meritorious, as it provides the last step in that public school system required by the state constitution—"free and equally open to all."

The plan, though, seems to me to have two important defects. The first is that it places no emphasis upon the development of anything less than a full four-year high school, and the second is that it places no emphasis on breadth within the four-year high school, once it is developed.

The first objection is naturally tied up with the movement for the consolidation of schools, upon which California has as yet placed almost no emphasis. In more than two-thirds of the counties of the state there are growing communities which would form natural concentrating centers for union schools, and where not only a consolidated elementary school but a two-years' high school as well might easily be maintained. Such a school could frequently be maintained at less cost than the present scattered and inefficient rural elementary schools, but so strong is the district system, with its jealousies and its inability to unite for constructive undertakings, that no progress in the consolidation of schools has as yet been made. If the state aid for high schools were extended so as to include approved two-years' high schools, as well as "such four-years' high schools as possess an adequate equipment of buildings, library, laboratories; employ at least two teachers; and have at least twenty pupils in average daily attendance throughout the year," as the law now requires, it would be of very material assistance not only in stimulating consolidation, but also in developing many other small high schools as well. If one-half of the value of the present school-unit and daily-attendance grants were given to approved two-years' high schools, having an average daily attendance of ten and

a reasonable working equipment, and which were so organized and conducted as to form a part of a county system of secondary education, it would be a desirable improvement in the present law. It is possible that a three-fourths grant for approved three-years' high schools might also prove of benefit, and a grant of one and a quarter or one and a half times the present grants might also be made with propriety to the developing five and six years' high schools in the cities of the state. Some form of general supervision would be needed in all such cases to secure a proper integration of the instruction in the different sized schools.

The second defect, that of placing no emphasis on the broadening of the school, once it is created and accepted for state grants, is far more of a fundamental defect in the California plan. Having once encouraged the formation of a high school, the state ought to encourage the development of that high school to the fullest possible extent. Breadth, as well as length, is a requirement of good high-school education today.

I can best explain what I mean here by a table, showing the value of the grants made to a series of high schools of different sizes, and the value of such grants under different educational conditions.

*Table IV. Per Cent of Cost of Maintenance Paid by State Grants.*

| School. | Average daily attendance. | No. teachers employed. | Estimated cost maintenance. | State Aid Received. |                   |           | Approx. cost paid from state grant. |
|---------|---------------------------|------------------------|-----------------------------|---------------------|-------------------|-----------|-------------------------------------|
|         |                           |                        |                             | School grant.       | Daily att. grant. | Total.    |                                     |
| A       | 20                        | 2                      | \$ 2,500                    | \$794.78            | \$ 199.80         | \$ 994.58 | 40%                                 |
|         |                           | 3                      | 3,600                       | 794.78              | 199.80            | 994.58    | 28%                                 |
| B       | 40                        | 2                      | 2,500                       | 794.78              | 399.60            | 1,194.38  | 48%                                 |
|         |                           | 3                      | 3,600                       | 794.78              | 399.60            | 1,194.38  | 33%                                 |
|         |                           | 4                      | 4,800                       | 794.78              | 399.60            | 1,194.38  | 25%                                 |
| C       | 60                        | 2                      | 2,500                       | 794.78              | 599.40            | 1,394.18  | 55%                                 |
|         |                           | 3                      | 3,600                       | 794.78              | 599.40            | 1,394.18  | 39%                                 |
|         |                           | 4                      | 4,800                       | 794.78              | 599.40            | 1,394.18  | 29%                                 |
|         |                           | 5                      | 6,000                       | 794.78              | 599.40            | 1,394.18  | 23%                                 |
| D       | 100                       | 3                      | 3,600                       | 794.78              | 999.00            | 1,793.78  | 50%                                 |
|         |                           | 4                      | 4,800                       | 794.78              | 999.00            | 1,793.78  | 37%                                 |
|         |                           | 5                      | 6,000                       | 794.78              | 999.00            | 1,793.78  | 30%                                 |
|         |                           | 6                      | 7,500                       | 794.78              | 999.00            | 1,793.78  | 24%                                 |
|         |                           | 7                      | 9,000                       | 794.78              | 999.00            | 1,793.78  | 20%                                 |
| E       | 300                       | 8                      | 10,500                      | 794.78              | 2,797.00          | 3,591.78  | 34%                                 |
|         |                           | 10                     | 13,000                      | 794.78              | 2,797.00          | 3,591.78  | 28%                                 |
|         |                           | 12                     | 16,000                      | 794.78              | 2,797.00          | 3,591.78  | 24%                                 |
|         |                           | 14                     | 18,500                      | 794.78              | 2,797.00          | 3,591.78  | 20%                                 |
|         |                           | 16                     | 21,000                      | 794.78              | 2,797.00          | 3,591.78  | 17%                                 |

The cheapest thing for a community to do, this table shows, will be to provide as meagre a four-years' course of instruction as possible. Up to an average daily attendance of sixty or seventy pupils, the requirements of the state will be met by maintaining only a single four-years' bookstudy course of instruction, with from two to three overworked teachers employed. Latin, Greek, English, History, Mathematics, and some Physical Geography and Civics will meet the requirements as to instruction, and will be at the same time the cheapest form of instruction which could be provided. A room, a stove, some desks, and a teacher will meet the requirements. In the case of school C, with sixty pupils in average daily attendance, the two-teacher estimate will illustrate such a condition. The state aid here pays 55% of the cost of maintenance, and the state offers no incentive to such a community

ever to do more. The three-teacher estimate for the same school shows what will happen when a teacher of modern languages and music is added; the four-teacher estimate shows the result when a teacher of science and drawing is added; and the five-teacher estimate shows what will happen when a teacher of commercial and manual work is employed. The value of the state grant, though, constantly decreases from 55% of the cost of instruction to 23%, and if agriculture were to be added, the value of the state grant would drop to below 20%. The present apportionment plan offers no incentive to communities to add additional teachers and to broaden the course of instruction in the high school to meet modern needs, but rather places a premium on conservatism and inaction. The school with few teachers receives too much state aid, while the school with an adequate teaching force receives too little. After the establishment of the high school, which in itself represents a certain unit of cost, the real unit of further cost is the number of teachers actually employed. The attendance is a far less reliable measure of educational efficiency, and too much importance (§) is given to it in the California plan. On the other hand, the number of teachers actually employed, as a measure of the breadth of the instruction offered, is an important item which ought not to be omitted in the construction of any apportionment plan.

After making a number of different calculations, I have found that if the California high school apportionment plan were revised by dividing the money into three portions instead of two, and into portions of one-fourth, one-third, and five-twelfths respectively; and then if the one-fourth portion were distributed equally to each approved school; the one-third portion to the different schools on the basis of their average daily attendance; and the five-twelfths portion to the different schools on the basis of the number of teachers actually employed; we would get a much more equitably arranged apportionment plan. The following table will show this, the table being calculated on the basis of the money available for distribution in 1911-12, and the number of schools, teachers and pupils in attendance for that year.

Table V. Working of Proposed Revision of the Apportionment Plan.

| School | Av. daily Att. | No. Trs. Empl. | Est. cost of maintenance. | State Aid Received. |                       |                     | Total Rec'd. | Ap'rx. % of cost paid. |
|--------|----------------|----------------|---------------------------|---------------------|-----------------------|---------------------|--------------|------------------------|
|        |                |                |                           | School grant        | Trs. grant @ \$166.70 | Att. grant @ \$4.60 |              |                        |
| A      | 20             | 2              | \$ 2,500                  | \$ 574.50           | \$ 333.40             | \$ 92.00            | \$ 999.90    | 40%                    |
|        |                | 3              | 3,600                     | 574.50              | 500.10                | 92.00               | 1,166.60     | 28%                    |
| B      | 40             | 2              | 2,500                     | 574.50              | 333.40                | 138.00              | 1,091.90     | 44%                    |
|        |                | 3              | 3,600                     | 574.50              | 500.10                | 138.00              | 1,258.60     | 35%                    |
|        |                | 4              | 4,800                     | 574.50              | 666.80                | 138.00              | 1,425.30     | 30%                    |
| C      | 60             | 2              | 2,500                     | 574.50              | 333.40                | 276.00              | 1,183.90     | 48%                    |
|        |                | 3              | 3,600                     | 574.50              | 500.10                | 276.00              | 1,350.60     | 37%                    |
|        |                | 4              | 4,800                     | 574.50              | 666.80                | 276.00              | 1,517.30     | 30%                    |
|        |                | 5              | 6,000                     | 574.50              | 833.50                | 276.00              | 1,684.00     | 28%                    |
| D      | 100            | 3              | 3,600                     | 574.50              | 500.10                | 460.00              | 1,534.60     | 42%                    |
|        |                | 4              | 4,800                     | 574.50              | 666.80                | 460.00              | 1,701.30     | 35%                    |
|        |                | 5              | 6,000                     | 574.50              | 833.50                | 460.00              | 1,868.00     | 31%                    |
|        |                | 6              | 7,500                     | 574.50              | 1,000.20              | 460.00              | 2,034.70     | 27%                    |
|        |                | 7              | 9,000                     | 574.50              | 1,166.90              | 460.00              | 2,200.40     | 25%                    |
| E      | 300            | 8              | 10,500                    | 574.50              | 1,333.60              | 1,380.00            | 3,288.10     | 30%                    |
|        |                | 10             | 13,000                    | 574.50              | 1,667.00              | 1,380.00            | 3,621.50     | 28%                    |
|        |                | 12             | 16,000                    | 574.50              | 2,000.00              | 1,380.00            | 3,954.90     | 27%                    |
|        |                | 14             | 18,500                    | 574.50              | 2,333.80              | 1,380.00            | 4,288.30     | 23%                    |
|        |                | 16             | 21,000                    | 574.50              | 2,667.20              | 1,380.00            | 4,621.70     | 22%                    |

In this table, as in Table IV, I have used the amounts apportioned during the year 1911-12, and in this table I have simply reapportioned the same money under the proposed revision stated above. If, now, we combine Tables IV and V, we get Table VI, which compares the results under the present apportionment plan and under the proposed revision, and shows the greater justice of the latter to all classes of schools.



*Table VI. Present and Proposed Apportionment Plans Compared.*

| School | Average daily att'ance | Teachers employed. | Cost for maintenance. | Present Plan.    |            | Proposed Plan.  |            |
|--------|------------------------|--------------------|-----------------------|------------------|------------|-----------------|------------|
|        |                        |                    |                       | Grant rec'd now. | % of cost. | Proposed Grant. | % of cost. |
| A      | 20                     | 2                  | \$ 2,500              | 994.80           | 40%        | \$ 999.90       | 40%        |
|        |                        | 3                  | 3,600                 | 994.80           | 28%        | 1,166.60        | 32%        |
| B      | 40                     | 2                  | 2,500                 | 1,194.38         | 48%        | 1,091.90        | 44%        |
|        |                        | 3                  | 3,600                 | 1,194.38         | 33%        | 1,258.60        | 35%        |
|        |                        | 4                  | 4,800                 | 1,194.38         | 25%        | 1,425.30        | 30%        |
| C      | 60                     | 2                  | 2,500                 | 1,394.18         | 55%        | 1,183.90        | 48%        |
|        |                        | 3                  | 3,600                 | 1,394.18         | 39%        | 1,350.60        | 37%        |
|        |                        | 4                  | 4,800                 | 1,394.18         | 29%        | 1,684.00        | 30%        |
|        |                        | 5                  | 6,000                 | 1,394.18         | 23%        | 1,684.00        | 28%        |
| D      | 100                    | 3                  | 3,600                 | 1,793.78         | 50%        | 1,534.60        | 42%        |
|        |                        | 4                  | 4,800                 | 1,793.78         | 37%        | 1,701.30        | 35%        |
|        |                        | 5                  | 6,000                 | 1,793.78         | 30%        | 1,868.00        | 31%        |
|        |                        | 6                  | 7,500                 | 1,783.78         | 24%        | 2,034.70        | 27%        |
|        |                        | 7                  | 9,000                 | 1,793.78         | 20%        | 2,200.40        | 25%        |
| E      | 300                    | 8                  | 10,500                | 3,591.78         | 34%        | 3,288.10        | 30%        |
|        |                        | 10                 | 13,000                | 3,591.78         | 28%        | 3,621.50        | 28%        |
|        |                        | 21                 | 16,000                | 3,581.78         | 24%        | 3,954.90        | 27%        |
|        |                        | 14                 | 18,500                | 3,591.78         | 20%        | 4,288.30        | 23%        |
|        |                        | 16                 | 21,000                | 3,591.78         | 17%        | 4,621.70        | 22%        |

The comparisons given in the above table show the greater justice of the proposed plan, and its great value in stimulating school authorities to put in additional teachers and to broaden the course of instruction. Under the proposed revision of the apportionment plan schools which do little would not receive so much, while schools which do much would receive more than they now receive. This comparison is brought out still better by the following chart, showing the same results, graphically.

The advantages of the proposed revision being evident in the greater stimulus it gives to communities to broaden their instruction and supply a sufficient teaching force, it remains now to examine the proposed revision from another angle to see if the plan would be equally just when applied to all classes and sizes of high schools. For this purpose I recalculate Table II under the new plan, using the figures for 1911-12, and assuming schools employing about the average number of teachers.

PERCENTAGE OF COST PAID BY STATE HIGH SCHOOL GRANTS, TO DIFFERENT SIZED SCHOOLS AND UNDER DIFFERENT EDUCATIONAL CONDITIONS.

Explanation. *Present Plan.*  
 = *Proposed Plan.*  


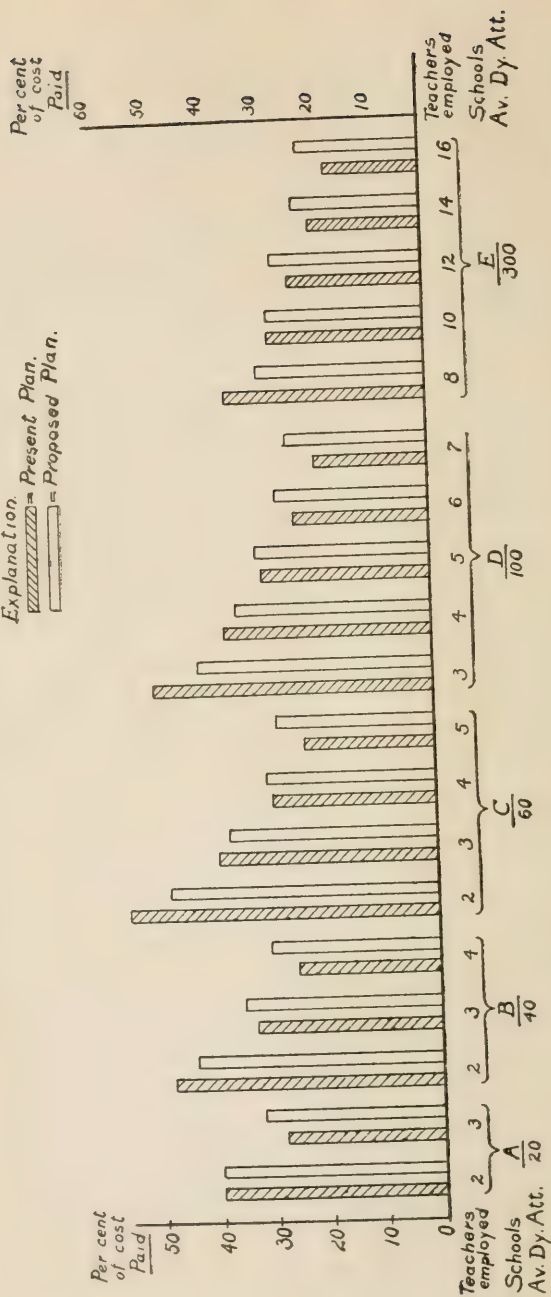


Table VII. Grants Schools of Different Sizes Would Receive under the Proposed Revision of the California Apportionment Plan.

| Av. daily Att. | Trs. | Attendance grant, @ \$4.60 ( $\frac{1}{2}$ part). | Teacher grant, @ \$166.70 ( $\frac{1}{2}$ part.) | School unit grant, @ \$574.50 ( $\frac{1}{4}$ part). | Total grant. | Value of per pupil in average daily attendance. |           |
|----------------|------|---|--|--|--------------|---|-----------|
|                |      |   |  |  |              | New plan.                                       | Old plan. |
| 20             | 2    | \$ 92.00  | 333.40   | \$574.50   | \$ 999.90    | \$49.99   | \$49.72   |
| 30             | 2    | 138.00  | 333.40   | 574.50   | 1,045.00     | 34.86   | 36.48     |
| 40             | 3    | 184.00  | 500.10   | 574.50   | 1,258.60     | 31.48   | 29.86     |
| 50             | 3    | 230.00  | 500.10   | 574.50   | 1,304.60     | 26.09   | 25.88     |
| 60             | 3    | 276.00  | 500.10   | 574.50   | 1,350.60     | 22.51   | 23.23     |
| 70             | 4    | 322.00  | 666.80   | 574.50   | 1,563.60     | 22.33   | 21.34     |
| 80             | 4    | 368.00  | 666.80   | 574.50   | 1,609.30     | 20.12   | 19.92     |
| 90             | 5    | 414.00  | 833.50   | 574.50   | 1,822.00     | 20.24   | 18.82     |
| 100            | 5    | 460.00  | 833.50   | 574.50   | 1,868.00     | 18.68   | 17.93     |
| 150            | 6    | 690.00  | 1,000.20   | 574.50   | 2,264.70     | 15.09   | 15.28     |
| 200            | 8    | 920.00  | 1,333.60   | 574.50   | 2,828.10     | 14.14   | 13.96     |
| 300            | 12   | 1,380.00  | 2,000.40   | 574.50   | 3,954.90     | 13.18   | 12.64     |
| 400            | 16   | 1,840.00  | 2,667.20   | 574.50   | 5,081.70     | 12.70   | 11.97     |
| 500            | 20   | 2,300.00  | 3,334.00   | 574.50   | 6,208.50     | 12.41   | 11.58     |
| 750            | 28   | 3,450.00  | 4,667.60   | 574.50   | 8,691.10     | 11.59   | 11.18     |
| 1,000          | 35   | 4,600.00  | 5,834.50   | 574.50   | 10,709.00    | 10.70   | 10.78     |
| 1,500          | 45   | 6,900.00  | 7,501.50   | 574.50   | 14,401.00    | 9.60  | 10.52     |

The last two columns compare the two plans, and shows their practical identity in results for all classes of schools. The proposed revision, giving emphasis to the teacher as one of the important units of cost in school maintenance, gives practically the same per capita results for all sizes of schools. This is brought out even more clearly in the accompanying chart (Chart II), where it is seen that the two lines practically coincide.

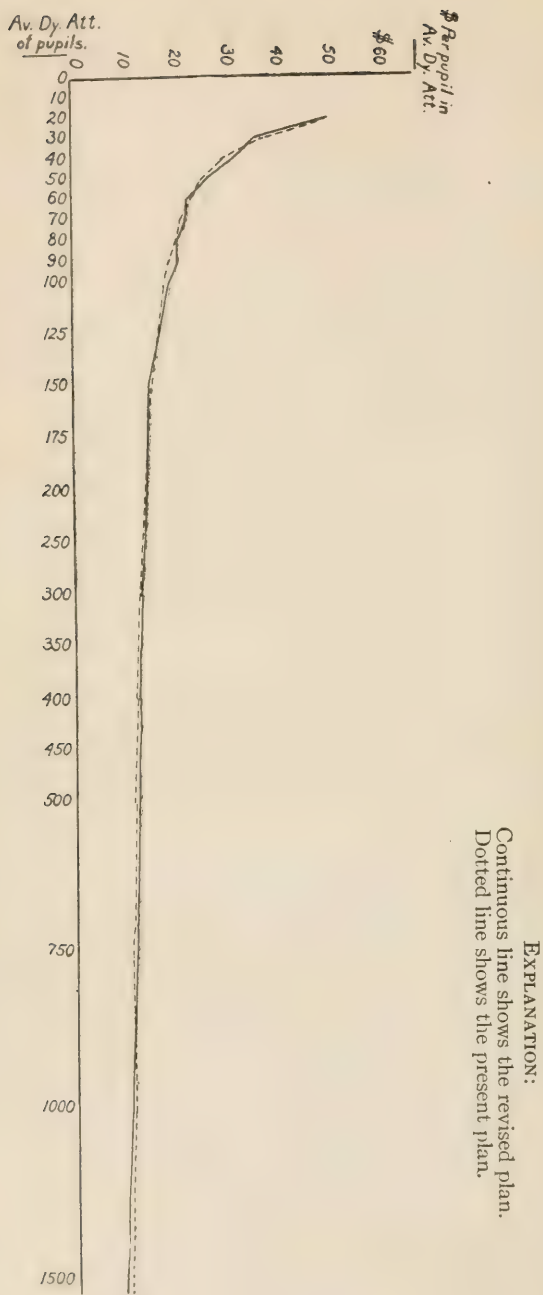
Following the presentation of this excellent paper, so full of suggestiveness for us here in Illinois, came the report of the committee appointed last year on The Standard of Preparation, both in scholarship and Professionally, for High School Teachers. Below is given the full report of this committee. This report represents the first official action of any representative body of teachers in Illinois on this very vital question. President L. C. Lord of Charleston, chairman of the committee, read the following report:

REPORT OF THE CONFERENCE COMMITTEE ON THE STANDARD OF PREPARATION BOTH IN SCHOLARSHIP AND PROFESSIONALLY FOR HIGH SCHOOL TEACHERS.

The committee submits the following report:

While it would be impracticable at the present time to formulate a rigid system of requirements in the preparation of high school teachers,

# VALUE OF THE STATE AID GRANTS FOR HIGH SCHOOLS BASED ON THE AVERAGE DAILY ATTENDANCE OF PUPILS.



it is the belief of the committee that the following minima may be safely taken as the standards which colleges, normal schools, and universities on the one hand, and public school officers on the other hand, may well have in mind in training and in selecting high school teachers. It is the belief of the committee that definite standards reasonably administered are richly justified by their ultimate results. It is true, however, that such standards may work inequitably in individual cases; and this danger should be recognized and the rights of such individuals should be carefully safeguarded.

With this preliminary statement, the committee makes the following recommendation:

1. The high school teacher should have had, before beginning his teaching work, at least four years of training beyond graduation from a secondary school.

2. This period of higher training should include (a) at least twenty (20) semester hours in the major subject that the candidate proposes to teach. By a major subject is meant a principal subject of the high school curriculum; for example, English; history and government; mathematics; physical sciences; biological sciences; foreign languages; agriculture; commercial subjects. (b) At least twenty (20) semester hours devoted to at least two minor subjects.

3. All candidates for high school teaching positions should have work in English extending through at least two years, with the emphasis upon oral and written composition. The committee is impelled to make this recommendation because of the deficiencies in English that so frequently characterize high school teachers. The committee recognizes, however, that even the best technical training in English composition will not alone suffice to accomplish the desired results. In addition to this, every effort should be made in all classes to develop adequate habits of clear and concise expression, and to encourage effective standards of diction, syntax, and logical organization. We recommend that the conference urge upon college and university authorities the importance of emphasizing this phase of education in *all* classes in which intending high school teachers are enrolled.

4. The committee recommends that professional study, to the extent of at least nine semester hours in the principles of education and the technique of teaching (including class management and school hygiene) should be recognized as a minimum; and that five additional semester-hours of practice teaching under supervision should be provided wherever practicable.

The committee also takes this occasion to urge the importance of developing in candidates for high school positions an effective *professional attitude* toward the work of secondary teaching. While we believe that courses in educational theory will not alone effect this, we believe that such a course, supplemented by practice teaching, will increase the efficiency of the professional work. But we also believe that the adequate professional training of teachers from this point of view cannot be accomplished until intending teachers are gathered together for part of their course in a school or college of education which will represent in the general university organization the ideals of public school service. It is to be regretted that many universities and colleges do not at the present time provide such an organization.

Until the university graduate is imbued with that consecration to the service of the public schools that characterizes the graduates of our best normal schools we cannot say that the University is doing its full duty in the preparation of teachers.

It will be noted that the suggested minima in these several phases of preparation will leave to the candidate a fairly wide margin for courses that are not specifically and technically related to his professional work. The committee would deprecate narrow specialization in either the academic or the professional phases of preparation. At the same time, the committee would urge that each candidate become fairly proficient in some of the arts and activities which are important in the extra-scholastic phases of high school life. We refer to music, debating, public speaking, athletics, and similar activities.

|                 |             |
|-----------------|-------------|
| L. C. LORD,     | } committee |
| THEODORE KEMP,  |             |
| W. C. BAGLEY,   |             |
| H. B. WILSON,   |             |
| W. R. SPURRIER, |             |

The above report was unanimously adopted, and the session adjourned.

### *Friday Evening Session.*

The second general session of the conference convened at 8 o'clock, Friday evening, Nov. 22, in the Auditorium. The address of the evening was given by Professor E. L. Thorndike, of Teachers College, Columbia University, who spoke, in part, as follows:

Professor Thorndike noted that the retardation was in the main due to failure of promotion, and that elimination was its frequent con-

sequence. He showed that failure of promotion was more probable in the later grades for any one pupil, and that, even though those less gifted at school work were continually dropping out from the fourth grades on, failure of promotion was as common in the high schools, so far studied, as in the elementary schools. After reviewing the general facts and principles involved, he illustrated the relation of retardation during the high school course to elimination by the facts concerning pupils leaving high school in New York City. Of 77 who left high school after more than one year and less than one and a half years in high school, who should therefore have been in the 2A grade, only 30 had reached that grade, 37 being in the 1B and 10 still in the 1A grade. Of 115 who left high school after from one and a half to two years, who should therefore have reached the 2B grade, only 30 had reached it, 43 being in the 2A, 40 in the 1B, and 2 still in the 1A grade. Even of 248, (out of 958 entering pupils) who stayed four full years, only 111 graduated at the end of this period; 137 of even these 248 selected students having been held back—41 for one grade (a half-year's work), 26 for two grades, 16 for three grades, 11 for four grades, 4 for five grades, 1 for six grades, and one girl was actually beginning at the very beginning after four years.

It was shown further that retardation in the high school lacked the saving grace of accompanying acceleration or double promoting.

After presenting the facts concerning the amount of elimination in high schools, the speaker discussed the causes of elimination in some detail. Diagrams were drawn to show the influence of race, age at entrance, career which the pupil expected to follow, intention manifested (on the day of entrance) concerning the completion of the course, ability as estimated by his teachers in the first months of a pupil's stay, average mark attained in the first few months, economic condition of the family, and other factors. In commenting on these diagrams, Professor Thorndike said:

"The diagrams tell their own story better than words. If a record such as Mr. Van Denburg got from these thousand pupils should be obtained from all the entering pupils of New York City's public high schools, we could prophesy the length of each one's career as we now prophesy the temperature of a day in December, the daily horse-power to be got from a stream, or the length of a patient's illness. If we knew nothing at all of a pupil entering in February, 1906, save that he did enter, we could foretell that he had an even chance of staying three and two-fifths terms, or 17 months. Know also that his father was born in Russia, and you can add 3 months to his expectation. Know that his father was born in Ireland, and you can reduce his expectation to 8.8 months, or a little over two-fifths that of the Russian Hebrew. Know that a boy reports himself as intending to be a lawyer, and you may expect him to stay nearly two and a half times as long as a boy who reports himself as in-

tending to go into business. Know that a girl intends to be a teacher, and her expectation of high school life is over three and a half times as long as that of a girl intending to be a stenographer and two and a third times as long as that of a girl reporting herself as undecided. The mere fact that a boy or a girl regards a high school course as necessary for his intended work in life more than doubles his expectation. The mere fact that a pupil reports himself as expecting to complete the course gives him nearly five times as long a probable stay as the pupils who expect not to complete it (4.4 times for boys and 5.2 times for girls).

"Such educational probabilities should be used to determine both the advice and the treatment given to individuals. High-school principals should, so far as time allows, get such an initial record form each pupil, should use it for the time being in the light of Dr. Van Denburg's study, and eventually, by following two or three entering classes through four years, calculate the expectation for each factor in their own communities.

"The economic condition of the pupil is shown to be relatively a minor factor. The wealthiest, the poorest, and those with rentals from \$27 to \$37 stay in school about equally long. Practically all of the common talk about the economic factor in elimination is thus shown to have been mere speculation in the case of New York high-schools. Is it, perhaps, equally so in your own community?

"The boy or girl who so impresses his teachers as to be ranked in the top tenth of the entering pupils for ability will stay four and a quarter times as long as the one who is so ranked in the bottom tenth. A rating in the top third compared with one in the bottom third nearly trebles (2.7 times) the probable high-school career. An average mark of 80 or more for the first few months means a stay five times as long as an average mark below 50.

"These school marks and teachers' judgments of ability doubtless measure the specialized ability to do well in scholarly work, of which interest in the high school tasks is a large component, rather than absolutely general ability for all life's work. Just how close the correlation between the two is has not been determined. But it is positive and high. So that while freely allowing that some really gifted pupils are ranked low and that some pupils, whose special gifts at lesson-getting conceal their essential stupidity, are ranked high, it is nevertheless certain that one cause of elimination in New York City high schools is lack of intellect.

"Time is lacking to comment further than I have incidentally done on the significance of those facts. I will barely mention the articles of faith which, as I believe, should guide us in administering high schools in respect to the retention of pupils and their rate of progress through the high-school course.

"This country's greatest educational achievement—one unparalleled anywhere else in the world—is the retention in school of four children in ten through 15 years, and one child in ten to 19 years of age. To save gifted youth from bondage to immediately productive labor, and give them special training for doubled productive labor and nobler use of leisure later, is a profitable national investment and a sign of our nation's health and idealism. The ones saved are in general those who have the interest in, and ability at scholarship, who like to think and learn, and can think and learn, about mathematics, languages, sciences and the more intellectual arts. This, so far as it goes, is well. The American high school, in New York City, at least, is as fine a democracy of learners and learning as the world has ever seen. Access to it and continuance in it is independent of birth, wealth, and caste to an extent that may well be a model for universities, the church, and community life. We must keep it so and make it more so. A teacher can do no better day's work than to find a job for a gifted boy permitting him to continue through high school. It is, we must remember, of far more profit to get and hold for higher education those who can use it for the world's good than to keep the incompetent out. Any symptoms of the spirit of caste—of seeking a high-school education in order to be distinguished from the workers of the world, in order to be labeled as one who can afford four years of semi-leisure—of culture of the ornamental, ostentatious sort—must be treated with extremest severity. Those teachers whose words or ways make continuance in high school mean the pupil's accomplishment of knowledge to show that his parents had time and money to waste should at once retire to the millinery trades.

"The pupil who is gifted as a craftsman, artist or executive should be retained as well as the pupil gifted at lesson-getting and abstract thought. The pupil who fails in school and succeeds in life—with true success, not mere foxiness as a trader—is a standing proof of imperfection in our administration.

"As to retardation. With equal amount of work some pupils must be expected to make only half or even a third of the progress of others. It does no great harm to have some pupils spending five or six years on the high-school course, if four is the time required for the average entering pupil. But if four is the time required for the average entering pupil, there should also be pupils finishing it in three or two and a half years, even two years. As a matter of fact, four years is not the time required for the average entering pupil, but for those much superior. Even so, some pupils should be encouraged to complete this course in three and a half or three years.

"The high school should be, then, a democracy of working learners, selected and retained by it by reason of their power to use high abilities in training for the satisfaction and improvement of human wants. These abilities should be those of any worthy sort—executive as well as scholarly; artistic as well as scientific; concerned with the industries of the world as well as with its noble use of leisure; concerned with work of women in the home as well as with the work of men in industry, commerce and the professions.

"These working learners of high abilities we must find and hold, give the education which the common good requires, and allow to progress through the course as rapidly as health and home duties permit. For those who lag and fall by the way, other sorts of training, in school and out, must be provided. It is no kindness to them to direct the energy of the high school away from its proper work."

The final session of the conference was held on Saturday, Nov. 23, beginning at 9:30 A. M., in Morrow Hall. First came the report of a special committee on State Aid to High Schools. This was given by the chairman, Principal L. A. Fulwider, of Freeport. The report, which was unanimously adopted, reads as follows:

#### REPORT OF COMMITTEE ON STATE AID TO HIGH SCHOOLS.

Whereas, the problem of how best to maintain the public high schools of the state on a basis of efficiency, and yet on a plan broad enough to give to all classes equal opportunity for that kind of training, of high school grade, best suited to their respective abilities and needs as efficient members of a democratic state, is yearly becoming a more insistent one; and

Whereas, the problem of industrial and vocational education now calling for a more definite solution tends to intensify and render still more critical the situation as it affects high schools, to say nothing of the relief demanded for the elementary schools;

Therefore, Resolved: That we hereby express our approval of the main features of the present township high school law and the consolidated school law, as provisions which make possible the organization of all the people of the state into high school districts, so that all children may have access to a free high school education.

We promise our untiring support to the application of these laws,

in every practicable way, in all communities where children of high school age are still without free high school privileges.

2. Resolved: That we voice our approval of further legislation providing for the creation of ex-officio county boards for the districting of counties for high school purposes, the county superintendent to be chairman and the county judge and the states attorney, members.

3. Resolved: That we recommend a provision by the Legislature whereby the transportation to and from school of all children living beyond walking distance may be provided for out of the school funds, subject to a vote of approval by the people of any school district concerned.

4. Resolved: That provision should further be made for establishing and maintaining county high schools in all such counties as are otherwise unable to provide efficient high school education, such high schools to be free to the children of the counties in which they are located and their establishment to be optional, and subject to an affirmative vote by any county adopting the measure.

5. Resolved: That the state should provide funds, separate and distinct from the present school funds, for the subsidization of all high schools, undertaking one or more industrial or vocational courses, including courses in agriculture and continuation schools, to the extent of one-half the cost of maintaining such courses and schools, the control of such courses and schools locally to be under the authority of the present board of education.

6. Resolved: That in each high school district undertaking industrial or vocational education, there shall be an advisory board of citizens representing local industries.

7. Resolved: That a state board, or commission, should be provided, charged with the equitable and effective distribution of such funds.

8. Resolved: That any properly qualified pupil not residing in a high school district be permitted to attend any high school in the county, or on agreement of the two county superintendents of schools, any high school in an adjacent county, free of tuition, the high school receiving such pupil to be reimbursed to the extent of the cost per capita, less the per capita state aid, from a fund raised by a special tax, levied by the county supervisors, on all property located in the non-high school districts of the county in which the pupil resides.

9. Resolved: That a state fund should be provided whereby the State Department of Education may be able to establish a central supply of lantern slides and other illustrative material for the free use

of the schools in illustrating work in the various subjects taught, both in elementary and high school grades.

The above report was unanimously approved at the general session of the high school conference held on Sat., Nov. 23.

The speaker for the morning session was Inspector W. H. Hand, of Columbia, South Carolina, who came to present to us, "The County as a Unit for the Organization and Administration of High Schools." Following is the substance of his address:

Anything like an intelligent discussion of the subject assigned me renders it necessary to discuss very briefly the scope and function of the secondary school as interpreted today. Its scope and function at once place the secondary school in the very front rank of all educational institutions. It is at once the inspiration of the elementary school, the support of all higher institutions, and the agency in the preparation of the masses of the people for industrial efficiency, civic duty, and social enjoyment. This being true, the support, organization, and administration of the secondary school make one of the most complex and difficult problems met in modern education, if not in all modern society. To handle such a problem successfully is the task of a statesman, an economist, an educator, and a master executive. Well may we approach it with a keen realization of its magnitude.

Practically every American State is unequivocally committed to popular education of secondary grade at public expense. This final decision is based upon the accepted doctrine that an effective citizenship, a prosperous citizenship, and a happy citizenship must be a trained citizenship. In the language of Lord Kelvin, which is substantially that of Aristotle, to educate a man is to train him to make a living, and to make his life worth living. Men and women in all the professions and vocations in life need to be trained to think, to see, to feel, to work, to enjoy work, to make work profitable, to win leisure, to enjoy leisure, and to profit by leisure. We may never succeed in teaching all these things to all people, but we have voluntarily set up a high ideal, and we must not grow faint at the bigness of the task. There is no individual but can be improved by training. Not long since, I saw a flea circus, and after seeing what training would do for a flea, I could not help asking myself, What is impossible with a human being properly trained?

For centuries the secondary school was looked upon as a preparatory school for the college and university. Within very recent times we began to assign to the secondary school a different function.

This changed conception as to the function of the secondary school has already wrought a pronounced evolution in its scope. The high school of to-day, as in the past, is sending pupils in ever increasing numbers to institutions of higher learning, and is beginning to effect far-reaching transformations in the fundamental organization of colleges and universities; it is readjusting itself to the elementary school and giving to it a new impetus; but the greatest growth is in its widening circle of service to those who go out from it direct to enter upon their life careers. Men everywhere are demonstrating their faith in the high school by putting their money and their children into it. The insistent demand is for the best possible equipment for each high school pupil, whether he should go on to college, or to the technical school, or into some one of the many vocations. This demand has already given us several rather distinct and well-defined types of high school. We are familiar with the ordinary academic type, the industrial school, the commercial school, the vocational school, the trade school, and so on.

In this discussion the question naturally arises, Does this multiplication of types of high school give us what we need? At least some of us very seriously doubt it. Some of us have a strong conviction that to preserve the democratic spirit of our institutional life we should prevent as far as possible anything which fosters, or tends to foster, any kind of artificial social distinctions among our people. Anything that even tends to stratify society is un-American. To be sure, we shall always

have an aristocracy of character and efficiency, but it will spring from no one stratum of society. Instead of the high school of several types, America needs most the single type with the imperative variations and adjustments to local needs. When this question was more acute than it is to-day, President Eliot boldly declared that "the pretended democratic school with an inflexible program is fighting not only against nature, but against the interests of democratic society." Even the vocational high school needs a strong academic background, or basis, because it is the most democratic, the cheapest, and the most efficient. The man trained only for skill within the narrow confines of a single vocation or trade has his earning capacity increased. But if his thinking and seeing and feeling capacities remain untrained, it is doubtful if he can rise to high efficiency as a citizen. Moreover, in these days of almost magic changes in the industrial world by the introduction of machinery which almost in a day, destroys some craft centuries old, the most skilled in the mere technique of a vocation finds himself compelled to readjust himself to new conditions. To do this without serious loss requires a reserve stock of general knowledge and training. Again, provision must be made against the misuse or the abuse of leisure won by skill. Nature has decreed eight hours a day for sleep; labor laws have decreed another eight hours for labor; what shall be done with the remaining eight hours? In the answer to that question educators should be deeply concerned.

We have so long heard the high school period called the period of preparation—either for more advanced study or for entering upon the duties and responsibilities of life as citizens and workers—that we seem never to question the validity of it. It would be better to regard this period as one of discovery—a discovery of the capacities, the limitations, the ideals, the aspirations, and the dreams of the adolescent. Were we to regard it as a period of discovery, it is possible that some of the disastrous misfits in life might be avoided. We should at least cease attempting to prepare pupils until we found out something about what nature had fitted them for.

Now comes into view the importance of the most effective high school support, organization, and administration possible. The high schools cannot render the fullest possible service, unless generously and steadily supported, unless economically distributed, and until thoroughly organized and articulated into a symmetrical system. All these are matters of too much import to be safely or wisely determined by mere local sentiment, or left to local jealousies and small neighborhood ambitions. In America, to our hurt, educational institutions have grown up very much after the traditional manner of the location of the streets of Boston—along purely accidental paths. The so-called district system of school organization, so general in America, is destructive of everything resembling system. All of us recall that Horace Mann's most difficult task was to overcome the evils of the district system in Massachusetts. The scattered, isolated, independent, unarticulated, and ill-supported high schools should be brought into harmony, and for all purposes the county seems to offer the most workable unit.

Perhaps no stronger argument for a county system of high schools could be produced than the inadequate and uncertain financial support furnished through the district system. The smaller the territorial unit and the less wealthy the taxpayers in any unit, the more difficult it is to secure either a steady or an adequate revenue to support a good school. School revenues from small units are usually meager and spasmodic, and the poorer communities, regardless of their educational needs, either refuse to furnish the necessary revenue or give it so sparingly as to starve the schools into a state of chronic poverty. If the rural communities and the villages are ever to have adequate high school facilities, they must come through some source other than a district tax. Even in the wealthier communities the small territorial unit often finds it difficult to secure the revenue necessary to maintain a first-class school. It may be set down as a cardinal principle that in a democracy the wealthier communities should contribute to the support of the necessary civic institutions not only for themselves, but for the less able communities. But a corollary to this is that no community has the right to ask or to accept assistance from others until it has made some genuine effort itself.

An economic distribution of high schools is one of the most serious phases of maintenance and administration, and it is doubtful if such distribution can ever be

secured under the district system. The needed high school advantages of any considerable geographical unit should be better distributed and better articulated than can ever be done through independent local endeavor. A map of almost any county under the district system would reveal a deplorable lack of statesmanship in the distribution of its schools. The local jealousies and neighborhood rivalries, already mentioned, are too strong to be overcome by cold reason. Perhaps the fiercest opposition to an economic distribution of schools comes from the communities weak in taxable property and weak in the number of high school pupils. Such communities claim that they are unable to secure high schools. Sometimes such communities do suffer. Weakness as to taxable property should be no obstacle, provided the community has the necessary high school pupils. However, it is the height of folly to locate high schools where there are no high school pupils. To do so is as foolish as it would be to set up a smelting furnace where there is no ore. To undertake to establish and maintain efficient high schools so as to place one within easy reach of every high school pupil would bankrupt any State in the Union. If the public funds are to be wisely and economically spent, schools must be wisely distributed.

In rural communities and in villages the small high school of 20 to 30 high school pupils is often necessary. The organization and distribution of such schools and their relation to a central high school are matters which can be wisely and economically administered only through the large territorial unit. Moreover, it is utterly impossible for such schools to cope with the better equipped schools, yet most of us know that just such schools are the ones most pretentious in their undertakings.

The county of 750 square miles might have six to ten high schools ranging in attendance from 20 to 100 pupils, and in teaching force from one to four teachers. Of this number, considerably fewer than one-half could be regarded as efficient as to range of work, length of courses, and physical equipment. Now, local individual rivalry does not give the kind of development needed. The invariable tendency is to duplicate rather than to expand. A county system of organization and administration would at least make it possible to remedy this situation. At least two solutions would be available. Instead of six to ten schools each fighting for an existence, it would be possible to reduce the number one-half by consolidation. Thus the efficiency of the remaining schools would be increased by additional teaching force, or by a wider range of subjects, or by longer periods, or by additional teaching equipment, or perhaps by all these. Then comes the matter of transportation of pupils to the consolidated schools. Voluntary consolidations without some incentive will never prove a success, especially if the transportation of pupils at public expense is necessary. The reason is obvious: the maintenance of consolidated schools, together with the cost of transportation, is as great, if not greater, than the maintenance of the little schools before consolidation. The real advantage, therefore, of the consolidated school is overlooked by the average citizen, or is not appreciated at face value. He considers only the expense, not the increased efficiency of the school. All this takes no account of local pride and local jealousies—the most serious obstacle to consolidation.

Should it be found necessary to retain a large number of these little high schools, a county system would offer another solution—that of restricting the scope of the smaller ones, and at the same time developing at least one first-class high school in each county. This one first-class school would serve as a model, and the people at large would have the opportunity to learn and to appreciate the value of such a school. This last is no small consideration. Many a high school is inefficient because the people it serves know nothing better. Because they know nothing better they are content with what they have.

An illustration may be of service. In a certain county in a state where the district system prevails, there are three adjacent districts each maintaining a little high school. Each school is located in a village. These villages mark three points of a triangle nearly equilateral, and are about five miles each from the others. In the three schools are barely 75 high school pupils taught by four teachers full time and one teacher half time. Each school has a single three-year curriculum, each almost a duplicate of the other two. The school with full time of one teacher undertakes just about as much as the one with two teachers. In this county are 65 school districts, and a total of eight high schools. Since these three adjacent districts have in them

three high schools, the remaining five high schools serve, in some fashion, the remaining 62 districts. It may be added that in the whole county there is not a four-year school, although the county seat has a population of 5,000. Such an anomalous situation could hardly exist for seven years, as it has here, under a county high school system.

By a county system of organization and administration, the high schools of such territory can be so articulated and inter-related as to secure the widest possible range of courses of study adapted to the general and the specific needs of the pupils, and without harmful hiatuses or expensive overlappings. It is feasible to divide the schools into two classes—senior high schools and junior high schools, if necessary. The junior schools, because of their small revenue, smaller attendance, and smaller equipment, may be restricted in the subjects they undertake and the length of their courses. The senior schools, because of their better equipment, might undertake much more than the junior schools, and could be used as graduate schools for the junior class of schools. Should one part of the county be exclusively an agricultural community, a manufacturing community, or a mining community, the local high school could be made especially adapted to the local needs by a slight readjustment of the type curriculum.

To summarize, the county unit readily lends itself to securing increased and steady school revenues, provides for a sane and economic distribution of the schools throughout the State by avoiding needless hiatuses and overlappings, tends to allay community jealousies and to avert school quarrels through a consolidation of little schools, makes possible the organization of the individual schools into a system, and invites an improved policy of administration.

The conference adjourned for one year.

## PART II.

### CONFERENCE OF COUNTY SUPERINTENDENTS AND VILLAGE PRINCIPALS.

This was a conference called to consider: (1) The question of unification of high school work in counties. The plan for such unification as given in the revised State Course of Study, pp. 240-242, was fully explained by the High School Visitor. County Superintendents, Roy L. Moore, of Woodford Co., R. O. Clarida, of Williamson Co., and Charles McIntosh, of Piatt Co., spoke favorably of the experience had in their counties thus far in following out such a plan.

After some further discussion and questions a motion was made and it was voted unanimously that this plan be approved and recommended for state-wide adoption.

(2) The question of the organization of "Counties into Free High School Districts" was discussed ably by County Superintendents, A. L. Odenweller, of Henry County, and Otis P. Haworth, of Vermilion Co.. A general discussion followed which developed a favorable attitude toward this movement, and also toward the movement for consolidation of the rural schools.

It was decided that in the opinion of those present this conference should be made a permanent section of the Conference, and an organization was perfected accordingly. The officers elected are: B. C. Moore, chairman, and F. A. Gilbreath, Secretary.

Following is the paper read by County Superintendent Odenweller, of Henry County:

#### A VIEW OF COMMUNITY HIGH SCHOOLS UNDER THE ACT OF 1911.

It is the intention in this paper to set forth, with special reference to Henry County, some of the reasons for the advocacy of free high schools and the merits of the High School District Act of 1911.

It seems to be the consensus of opinion of those competent to judge, and it seems to be the intent of the state constitution, interpreted by the Supreme Court, that a good common school education includes an elementary and a high school course, and that an institution offering such courses is the kind of school required.

Accepting this interpretation of a good common school, it is hardly probable that all the children of a county will receive free a good common school education

under the present small district unit system alone, small in area and small in population. The improvement of schools for country children has not kept pace with the advance of city schools, some opinions to the contrary notwithstanding. Ordinarily, country teachers are poorer instructors than city teachers, and the equipment, buildings and grounds in rural districts are inferior to those in towns. To say that country schools are better than they were forty years ago, is no answer to the charge. To say that the world's great men come from the farm is no answer; their preparation is largely attributable to activities outside the school.

The present poor condition of the country schools is doubtless due in large measure to the small district unit. Consider the administration in a county of two hundred districts where only three or four per cent have immediate expert supervision. Responsibility is divided among a multiplicity of school boards, each appreciating the independence and authority of the small district in a free country; school board conferences with a superintendent are infrequent; school terms vary materially in length, and half the time some of the schools are having vacation; inadequately prepared teachers are visited by a supervisor once or twice per year. Under these or similar conditions, the inefficiency of supervision is evident.

Again, in a small sparsely settled district, the school is small and its importance is judged by its size; anybody can teach it, any sort of building or seating or heating is good enough. And since anybody can teach it, a girl in the neighborhood teaches it at half price and continues the obsolete community ideals. It seems that the general public cannot get away from the erroneous idea that educational needs should be based solely upon enrollment. But rather than persist in the attempt to convince the people that a small school is entitled to the same consideration as a large one, we perhaps could more readily secure good school conditions by supporting a feasible and conservative proposition involving the interests of an increased number of children.

And again with reference to revenue: In a small sparsely settled district each taxpayer seems to feel that he makes a substantial contribution to every increased tax, be it ever so slight. In a small sparsely settled district every one knows about what the annual tax has been for the last forty years and views with alarm every proposed increased appropriation. In small districts that are not sparsely settled, but where taxpayers are few, the school board holds in high esteem the annual tax limit established by the fathers. Sometimes one man owns most of the land in the district. He controls the policy of the district and gives to the children on his farms such schooling as his generosity permits or as he thinks needful.

It is evident that the objections hereinbefore stated do not apply with equal force to city units of the same area. There the diversity, division and amount of property are not comparable to that in country districts. The population crowds out the pretentious independence and the personal financial responsibility. The village district is essentially like the city, except that the maximum tax levy in the village is insufficient to maintain a good school. The tax rate in one village district in Henry County last year, for running expenses was 1.80 on the \$100.00 assessed valuation. A sort of three year high school was maintained but its standards of efficiency were much inferior to those of the accredited schools of the county. The village cannot furnish a good high school; neither can the present country districts even if they were so disposed, and for each separately to attempt it is an economic waste.

In the maintenance of good schools, revenue is as essential as the teaching force; and it seems to be the history of school revenue in this country that the taxing unit for educational purposes can scarcely be too large. The township as a unit has proved better than one-ninth of that area; the county better than the township; and the federal government better than the state. In the smaller unit the appropriation is harder to get, uncertain, and increase is painfully slow, if at all. In the larger unit, however, school interests can count on the equivalent of the preceding appropriation with reasonable assurance of a continued increase.

The economist tells us that in the evolution of taxation no fundamental principles have ever been established or recognized as a basis for practical application, but that every form of taxation has been tried and adopted primarily from a governmental administrative point of view rather than because of any supposed economic

principle. And from a governmental administrative point of view, the township or community district is unquestionably superior to an area of four square miles.

But in principle the community district is still better. The theories of taxation are two: one according to benefit conferred, the other according to ability to pay. Upon the theory of benefit conferred, the poor, the weak and the indigent should bear the burden of taxation. And from the doctrine of benefit conferred it is only a step farther to that of benefit received, with the implied idea of exemption in cases in which it cannot be proved that the supposed benefit was received. It is evident that such a theory is intolerable, opposed to progress and modern science.

The other theory of taxation is that of ability to pay. It is in keeping with the trend of all modern reforms. It rests upon the assumption that since the individual's development and welfare at every stage are inseparably linked with the state, that the measure of governmental benefit is inestimable and hence that the only consideration in taxation is ability to pay. Income in a differentiated society is doubtless the best estimate of ability; but in this country we still cling to the primitive idea of capital. And if property may be considered a rough estimate of ability, then upon the generally accepted principle of ability to pay, it would seem that the farms of Henry County should contribute to the support of high schools and contribute in proportion to their worth the same as other property. Ownership in three hundred dollar land may reasonably be interpreted as ability to pay. The claim is made that the establishment of a community high school district is unjust in that it taxes all assessed property at the same rate, tho much city property evades assessment and taxation. But this is offset in part at least by the fact that generally farm land is assessed at one-third its fair cash value and town property at five-sixths.

It may be said that the community high school plan is a village scheme to secure the aid of farmers in establishing a good high school. What need has the village more than the country district for a good high school? Are not country children entitled to as good common school education as children in the village? In the language of John M. Coulter: "Is there any calling or occupation that cancels a man's obligation to make the most of himself for the good of the world?"

Some will say that they prefer to pay tuition for a term of years rather than a tax always, or choose rather to leave their property out in the country and move to town to educate their children, and thus secure high school privileges at half price or less. This proposes an application of an antiquated theory of taxation. Moreover, procedure of this character is stratifying society by creating one kind of school for the children of tenants and another, better kind for the children of landowners and the children of city folk.

If it be said that the taxation of nearby farm property for the support of a community high school in the city or village is wrong, an encroachment upon the rights of farmers, we answer that no man is born into the world with inherent rights. So-called rights are simply privileges granted by the state and which may be modified or withdrawn as the common interest demands. We answer with Matthew Arnold that the only way to determine the moral worth of a thing is by its effect upon society. If it redounds to the common good, it is right; otherwise, wrong.

The plan for county unification or standardization, or of official recognition of the average two or three year village or country high school, cannot be accepted as a substitute for the fully organized community high school for these reasons: (1) Country and village children should have good four year high school privileges at home. It is the business of the community to see to it that every child has desirable educational opportunities. (2) The physical equipment is likely to be inadequate. (3) The plan dodges the responsibility the community owes to those children whose parents are unable to pay tuition and unable to move to better schools. (4) The village or city should not be expected to furnish instruction to the surrounding country at half price, and yet it must be half price or prohibitive. (5) If salary is any indication of the real worth of a teacher, the small district cannot furnish a teacher comparable with that of the community high school. You may waive as negligible the proximity of schoolhouses to homes, and dismiss, if you will, as over-emphasized the significance of equipment, but there still remains the superior efficiency of the teaching force—enough it would seem to determine the character

of the school; enough it would seem to stamp the school as distinctly second-rate. And why should any first-rate farmer send his children to a second-rate school?

We should enlarge our views of the community and share in the promotion as well as in the benefits of associated interests. Where the people go to do their trading, to market their produce, to attend lodge and church, there should be a high school established to meet the needs of the people whose interests center there. And in settlements remote from market and store where community interests are well-defined and vital, there, too, near the country church and hall should be a high school. The larger administrative unit finances the school adequately; permits the introduction of special subjects, as music, drawing, directed play, physical culture, manual training, home economics, agriculture and other industries, with special equipment and trained teachers; affords a school not merely to qualify its students for admission to industrial, educational and social life elsewhere, but, to fit its members for service in the community. It provides a social center and induces the affiliation of local organizations. The school should lead in the community rather than follow. The community can put up a better building than any one of its members. And in landscape gardening, in architectural beauty, in artistic decorations, in the installation of a modern toilet system, a heating and ventilating system, or power plant, or bathing facilities, the school should be representative of the highest and best, and set standards for the home. For the same reason that the education of children was the last phase in the development of the educational system, it may be inferred that the interest of a community in the real needs of schools and the consequent co-operation for their general improvement will be more readily secured through the high school than through the elementary school.

The area of Henry County is 825 square miles and, in 1911, 735 square miles paid no high school tax.<sup>1</sup> In 1911, the assessed valuation of taxable property was twenty and one-half millions of dollars, and thirteen millions paid no high school tax. In 1911, the average school tax on property in districts supporting elementary schools only, was 51 cents on the \$100.00 assessed valuation, and for property in districts supporting both elementary and high schools, \$2.11. In the year 1911-12, there were enrolled in all the public schools in the county 8,142 pupils, 3,350 were residents of districts having no high school advantages. In 1911-12, 889<sup>2</sup> high school students were enrolled, 170 students paid tuition amounting to \$3,200, and the estimated cost of high schools only was \$49,300.00.<sup>3</sup> There were in the county, four accredited high schools including one township high school, three high schools attempting four years' work, not accredited, and six attempting less.

It will thus be seen that in 1911, in Henry County, eight-ninths of the area paid no high school tax; about two-thirds of the property paid no high school tax; the tax was four times as high in districts maintaining high schools; nearly one-fifth of the high school enrollment was from outside the high school district; the paid tuition per student was one-third the actual cost; a little more than one-third of the property was taxed not only for the high school education of the children within its territory, but to contribute two-thirds toward the education of the one-fifth enrollment from outside the high school territory; two-fifths of the pupils of the county or practically all of the children on the farms were without free high school advantages. And that does not indicate the real situation, for the reason that of the thirteen schools, considered as high schools in this paper, four only are adequate when judged by recognized standards.

Evidently there are possibilities for the improvement of secondary education in Henry County. And the people really wish better educational advantages than they now have, as is evidenced by the present (1912-13) tuition enrollment—186

<sup>1</sup> Five one-room country schools had eight pupils attempting work above the eighth grade but in this article are not considered having done high school work. These schools were in districts having a combined area of 18 square miles, an assessed valuation of \$311,000.00, a tax levy in 1911 of \$1,782.00, and an enrollment of 91 pupils. Also one two-room school that has previously done some high school work, did none in 1911-12 and is so classed. This district has an area of less than 4 square miles, an assessed valuation of \$105,697.00, a tax levy in 1911 of \$1,750.00, and an enrollment of 70 pupils.

<sup>2</sup> State Report, 897 high school students, includes those in country districts.

<sup>3</sup> State Report, \$48,453.82, does not include estimated cost of one and two year high schools.

in the high schools of the county, three in the John Swancy School in Putnam County, and the recent establishment of two community high school districts. Though inferior to a comprehensive county system, there is promise in the act of 1911, for the organization of high school districts. The act of 1911 is a local option law, a freak in composition, but in intent sane and American. It provides for the organization of any contiguous territory into a high school district at any time upon proper petition and notice, and an affirmative vote in the proposed territory. It makes possible the establishment of a high school district with a village or city as the center of area, and the realization of good schools in every community.

Considering the location of cities and villages, a conservative plan to furnish adequate free high school opportunities to every community in Henry county would necessitate, in addition to the present four accredited high schools, the making of fully organized high schools of the nine schools that are now doing some high school work, and the establishment of perhaps seven additional high schools, making twenty in all. It would seem reasonable to discontinue one of the present two-year high schools less than a mile apart, but we leave the number for the county twenty. For the purpose of estimating the revenue for the maintenance of all these high schools, we group in one class the three districts having the largest high schools, the Geneseo, Kewanee, and Galva, with a probable assessed valuation of \$7,000,000; and group in another class, the rest of the community high school districts of the county with an assessed valuation of \$13,500,000. The first class, to maintain its schools at a cost of \$37,300.00—the current expenditures of these schools in 1911-12—would require an average annual tax of 55 cents on the \$100 assessed valuation.

The Cambridge high school, in a town of thirteen hundred people, is the smallest accredited high school in the county. In 1911-12, this school had a teaching force of six, two special instructors, part time, and four regular teachers, including the principal and superintendent; it had an enrollment of 77 students; the cost of maintenance was \$3,100,<sup>1</sup> a little more than usual. The elementary schools of the district shared in the payment of the salaries of the superintendent and the two special teachers, as they likely would in most districts maintaining community high schools. Taking the Cambridge high school as a type for each of the remaining seventeen community high schools, and taking the Cambridge High School cost as a basis for the estimated current expenditures, the second class to maintain its seventeen schools would need an average annual tax of 40 cents on the \$100. To levy a tax of 68 cents for both educational and building purposes, as the Geneseo township district did last year, would mean the maintenance of the seventeen schools at the average cost above mentioned and almost enough more to build two nineteen-thousand dollar high school buildings. One maximum tax levy of \$3.00, as Kewanee made last year, would raise \$405,000, enough for educational purposes to maintain the seventeen schools three and one-half years at \$3,100 each per year, and enough for building purposes to build ten twenty-thousand dollar school houses. \$405,000 is an amount [amount only is being considered in this one statement, not the legitimate use of one tax levy] sufficient to maintain the schools for one year and build a twenty-thousand dollar school house in each of the seventeen districts. But some of the buildings are suitable now, and most of the schools could do well with three regular teachers, hence in furnishing free high schools to all the children of the county, the average tax in the second class would likely be less than that stated. The average annual tax for the twenty high schools of the county at the cost indicated would be 45 cents on the \$100.00.

The establishment of community high schools means inspiration to children in the grades; it means from one to four years longer at home for children in their schooling; it means, eventually, the equality of high school opportunity for children in

<sup>1</sup>State Report, \$3,528.40, includes all of the superintendent's salary of \$1,200.00. To allow the elementary school to share one-third in the expenditure for superintendent's salary is apparently more nearly accurate.

country, village and city; it means sufficient equipment and trained teachers, it means the introduction of special and technical subjects; it means a school, in every community, vitally related to the life of the people; it means vocational and social efficiency. To provide in the Community High School District Act that the principal of the high school should supervise all the grade schools in the high school territory, would mean adequate supervision for elementary country schools as fast as high school districts were organized, and ultimately the approximation of the educationist's conception of an efficient system of free schools whereby all children of a county may receive a good common school education.

## PART III

### SECTION MEETINGS.

#### ADMINISTRATIVE SECTION.

This section was presided over by Prin. C. P. Briggs, Rockford. The secretary was Prin. M. T. VanCleve, Eldorado.

The first subject discussed was "Place of Industries in Education." The discussion was led by Prof. Frank M. Leavitt, University of Chicago. After stating some general conditions and reading some quotations from eminent educators, he confined his remarks more specifically to three contentions: first, that the school man thinks that the old forms of education are sufficient for him and his school system; second, that it is necessary to go outside of the present system to establish industrial education; third, that the older forms of education and industrial training should be combined into one system. He especially recommended the third or last contention as the one most appropriate. Following is his discussion in part:

In discussing the question which has been assigned me, I should like to assume general agreement regarding certain economic and industrial conditions and certain educational ideals. These I will state briefly without argument.

I assume that it is agreed that there is lack of complete adjustment of educational ideals and methods to the present social and economic conditions.

It is agreed that we are fast becoming a manufacturing nation; that we are actively competing for the world's markets; that the factory methods of production are being more and more widely applied; that enormous corporations are employing a considerable percentage of the wage workers in the manufacturing industries (more than one-third in Illinois); and that these facts, together with the passing of the American frontier, should receive recognition in the planning of our school work. It is further agreed that manufacturers are determined to bring about some adequate system of industrial education, that organized labor perhaps is equally interested in the questions involved; and that social workers are urging attention to vocational training as a means of preventing or reducing juvenile delinquency. And finally we shall assume that the following resolutions of the National Education Association meet with the general approval of those present:

"Whereas: In spite of the fact that our schools have met well the social and economic problems which have confronted us to date, there has been an ever increasing demand by the public for greater proficiency on the part of our pupils of all ages and grades.

"Whereas: Such liberal education has, in a measure at least, failed to meet this demand in the opinion of those who judge by results; and

"Whereas: Many of our formerly well-accepted principles, as well as our educational traditions, are undergoing constant and rapid revision, as a result of the more recent scientific investigation and philosophic readjustments, be it

"Resolved: That this Association places itself on record as favoring such changes in the courses of study in our elementary and secondary schools, together with such changes in methods of instruction as shall make it possible to assist the pupils in the ready application of such knowledge as he may acquire to actual life conditions."

The topic which you have assigned me today is very properly a matter for the Administrative Section to discuss because it is now only a question of administration. A majority of thoughtful people now agree that industrial education is necessary; but the questions "How shall it be given, and where?" are debatable and are, in fact, under constant discussion.

There are many plans for the promotion of industrial education, but the most important administrative question connected with this introduction is whether we shall have a system of separate vocational schools or shall incorporate vocational education into the older forms of school work by a readjustment of present school organization. A few of the arguments most commonly urged for the separate system and for incorporation are herewith briefly outlined.

The separate systems will place the new schools under the control of those who are heartily and undividedly in favor of vocational education, whereas the present school boards, if such instruction were forced upon them, might conduct it in a half hearted way and without conviction that the work was of importance.

The separate system will make it possible to ignore traditional educational ideals and to adapt methods to the exigencies of actual conditions. Important considerations will be those relating to the qualifications of teachers, the elimination of subject matter that is of little immediate value, the adoption of actual commercial practices and methods of manufacture, and especially the close co-operation between the shop and the school, with the former influencing the latter decidedly.

The separate system is supposed to secure such close agreement between shop and school that the teachers are in sympathy with the employers, thus enabling the pupil to secure a position on leaving the school or to make rapid progress if already in the shop on a continuation school basis.

Admitting the advantages which adhere in the plan of separation, the advocates of a single system contend that there are certain serious defects in the separate system and also some great values attending incorporation which should not be neglected. The more important contentions are as follows:

Our existing schools have, during the past ten years, organized many different courses which have a more or less pronounced vocational content. In many cases, these courses are efficient today, and they are being rapidly multiplied and extended. If it should be decided that the new separate schools, only, should give vocational instruction, or should receive state aid therefor, these courses would be given up with great reluctance. It is inconceivable that the older schools would relinquish this work without a struggle and there would result a bitter competition for the same pupils, especially for the children between 14 and 16 years of age. The result must inevitably be professional jealousy between the two competing boards making extremely difficult the necessary articulation between the vocational training and the general education upon which it is, or should be based.

The experience of higher educational institutions during the past thirty years has proved conclusively that the separate *department* in the university, as for example the department of agriculture, medicine or law, is vastly more efficient than the separate agricultural college, or medical school, or law school. It is contended that the same principles apply to lower schools and that a department of agriculture in a high school will be superior to a separate agricultural high school. There are, in addition, certain social advantages in the cosmopolitan plan which are of uncalculable importance.

Furthermore, it is claimed that complete separation in administration will tend to defeat its own purpose, through failure to attract the pupils who most need the specialized instruction. It is the common experience of workers in this field that the parents of such children have an almost superstitious belief in the democratizing influence of the "regular" public school and in its ability to raise their children above the necessity for manual work. Many parents would refuse to let their children leave this school, which, they believe, offers "equal opportunity to all"

and enter a school which appears to be organized merely to teach children *how to work*. Where all this work is under one roof and one management, and where all the pupils form one student body, the specialized vocational work will prove more attractive to those who can profit by it.

And finally the regular public schools need the great popular interest which is now impelling the vocational education movement. The public school system is good in proportion as it holds the respect and interest of all classes of people, and without the regenerating influence of the struggle to keep the school close to the needs of the people it must inevitably become, even more than its critics deem it to be today, a dispenser of a leisure class, formal, and "academically" useless education. Instead of shunting this popular interest into the narrow channels of a separate vocational system, it should be utilized to regenerate and vitalize the whole institution of public instruction.

Such are the claims of the advocates of a single school system and I subscribe to them all. But, if our schools are to adjust themselves to the new demand they must permit the organization of courses which will be marked by singleness of purpose, directness of method, and definiteness in results. These courses must frequently be short courses, of an extremely practical and utilitarian character. The schools must welcome, in the administration of these courses, the assistance of advisory boards which will insure sufficient lay influence both in the management of the school and in the instructorial work, to keep the school abreast the times.

In conclusion, I would suggest the following plan for adjusting the secondary schools to meet the demand, which we now feel to be a real and a valid demand, for more systematic vocational instruction.

1. Provide for an earlier differentiation of purpose and for increased definiteness of plan for some of the pupils.
2. Develop distinct and highly effective *departments* in the high school, departments which do not fit for college.
3. Admit to these departments children of suitable *age*, whether graduates of the elementary school or not, if they are able to profit by the vocational courses offered.
4. Provide for such children a larger amount of concrete, or *practical* work in the first year.
5. Emphasize successes rather than failures, and individual differences rather than likenesses.
6. Show equal respect for *all* courses, and equal sympathy with all pupils.
7. Provide for active co-operation with the world of business and industry.

The discussion was continued by Mr. W. A. Richards, Supervisor of Manual Arts in the Rockford Public Schools. He spoke in part as follows:

The following questions always come to my mind whenever I hear mentioned, "The Place of Industries in Education."

- 1st. Is there a "place" or rather a "demand" for Industries in education?
- 2d. Where is the place? Is it in the primary, the intermediate, the high school, or in all?
- 3d. Should industrial work be given in technical, manual training, or in all types of schools?
- 4th. What should the courses of study be?

#### Answers.

To the first question it is safe to say that all educators agree that there is a "place" or rather a "demand" and that, a large one and from many sources. One of these sources from which there comes a powerful demand is the need of a well-balanced training, as was so strongly and ably advanced by those pioneers in industrial education who were instrumental in introducing manual training into our schools; another call, newer, if actually not stronger, nevertheless believed by me to be stronger, is the social call.

There are other calls that might be mentioned, but as you have heard them stated many times, and know them, and as it is my intention to discuss but one, the "Social Call," I will not take your time by repeating them.

### The Social Call.

With the advance of time, conditions are ever changing; especially is this so in regard to modes of living. One does not need to go far back into history to see this. I think most of us have seen numerous examples in our own lives, but should one need more than his own observations, let him study the changes in England from the time of the feudal system, only a few centuries back, to the factory period of today. Such a study will reveal a great industrial evolution and social progress. Here the people passed through three periods; the home, the guild, and the domestic stages before entering the factory period.

Our own changes have been much the same, only faster. Our forefathers had to make a living by hunting, trapping, or agriculture. There were no mills or factories; the home, and the industrial workers in the home built the houses, made the rude furniture, spun the yarn, wove the cloth, and made the clothing. But in time came the mills and factories, and then the work that had formerly been done in the home, and by the individual workers in the home, was taken up by the factories.

These changes have done two things which vitally concern the educators of today: First, great cities have been built up which have changed the conditions of living so as to take away from the children the opportunity to do manual work about the homes; and second, it has tended to place and hold the lives of the industrial classes within very narrow confines. The first change allows our youth to grow to the age when they must start to work without preparation for, or an idea of life. The second has by the specialized and subdivided occupations cramped the life of the individual by the very things that should have broadened it.

In the earlier times the growing child's life was such as to teach him responsibility and self-reliance, while the occupations gave to the mature worker a rather broad outlook. A person who worked at a trade under the old system knew the whole trade and not merely one of the many hundred small operations required to make a finished product, as is now the case. This specializing in work, compelled by the present day factory system, has a deadening effect on the minds of workers, which in a democracy may lead to disastrous results. Our task as members of society is not to tear down the present economical and labor saving factory system, but to retain it and eliminate its bad features, and to educate our future workers so as to counteract its deadening effects. This cannot be done without numerous changes. Already some are being made by legislation, and social agitation; but it is education that will do most.

In the memory of nearly everyone here, the boys and girls got their education in the homes, shops, or on the farms, and a little book learning in the schools. This is still true to some extent with the children on the farms and in the small towns, but the large majority of our children unfortunately are now in the cities, living in flats and tenement houses, where they have no tasks to perform or no responsibilities to shoulder and hence no education to be gotten in the manner of old. It, therefore, becomes the duty of the school authorities to introduce into the school system such work as will be a substitute for these home tasks of the past; such studies as will train boys and girls to become thinking men and women, good citizens, and better and more intelligent workers.

Manual training and other laboratory studies have done much towards taking the place of these former home tasks, and will continue to do a good work with certain classes, but it does not suffice for all. To the majority of our boys and girls, we must give more vocational work, and it must be an integral part of formal education; it must be so linked with other studies that it will do more than train hands and eyes; it must broaden the pupil and his outlook; it must be such as will make him a strong, healthy citizen, who knows how to live.

The social, political, and educational problem is: How can we best train our children so they will fit the conditions just mentioned? The answer seems to be: "By a system of education, the true function of which is directive. One that gives

a knowledge that will reduce, or better, prevent frictions in society which are caused by industrial and social changes." It must be an education that will train our youth so that when they become men, they can adapt themselves to all conditions of society. Education to fill these conditions in an industrial nation must be intensely industrial.

With this idea in view, comes our second question: Where shall our industrial studies be placed; shall they be in the primary, the intermediate, or in the high school? It is my belief that in the first four grades and possibly till the beginning of the seventh, we should make little or no change in our courses of study, except to lengthen the school day in the fifth and sixth grades so that hand work can be given each day. The hand work must be more varied in its character than at present. More materials must be handled, and handled in such a way that they will introduce the children into real life, and not merely amuse them. With the beginning of the seventh grade—for if we delay longer, we will be too late—we must start our industrial work in "real earnest." There should be two types of industrial work, one of a cultural nature for those children who show indications that they are fitted for higher schooling both by talents and finances; and one intensely industrial for those who by nature or other conditions will at an early age be compelled to step into the ranks of the workers.

The high school should likewise give two types of industrial work, with the idea of giving all some knowledge of the industries, and trade operations. For the few who are going into the professions the work should be of a cultural nature, while for the many it must begin to take on the qualities of the trades. Thus it will be seen that the "Place for Industries in Education" is in all grades from the primary through the high school.

There is still the question: Should it be in all schools or only in technical or vocational schools? I believe the answer to this is: It must be in all schools but not in all schools or for all pupils alike. We will possibly always have three types of schools above the primary; the classical or college preparatory schools, the industrial schools, and the cosmopolitan schools. The first will have industrial work, but it will be given for its cultural value. The second will have industrial work as the foundation of all its courses, and the third, the most general type of school, will have courses in industrial work to fit students who wish a cultural course, or the student who wishes early to specialize in some particular industry.

I believe that in all types of grade schools there should be a gate left open to enter at least one kind of high school course; but I do not think the industrial high school, or the industrial course in a cosmopolitan high school should concern itself about fitting its students to enter any college or college course. I believe that if it does that it defeats its purpose of training for the industries.

The industrial courses in each and all these schools must keep this point in view, to train our boys and girls so that when they grow up they will be good, industrious, thinking men and women, and citizens; people who know how to live and make a living.

The following recommendations have been made to the Board of Education of the City of Rockford, Ill., which I believe about fill the place of industries in the educational system of that city: 1st. A continuation school for boys, 16-20 years of age, who are employed in the various industries of our city.

2nd. A pre-vocational school, for the boys of the 7th and 8th grades, whose parents show they expect to place them in the industries upon completing the 8th grade or when they reach the age specified by the statutes (at present, 14 years of age).

3rd. A co-operative high school course of 4 years, for boys who have completed the 8th grade or the pre-vocational school.

#### Objects of the Courses.

##### 1st. The continuation course:

This course is to take boys, who, at the age of 16 or over, have started to learn a trade, and with whom the employer has entered into an agreement to allow one-half day a week (at full pay) to attend school. This half day in school to be under the same conditions as the shop in regard to hours and pay, i.e., absence from the school to be followed with reduction in pay, the same as absence from the shop.

The course will cover four years of 51 weeks each, making 816 hours of school work, and will have five objects in view; to teach the boy to think, to calculate, to read a mechanical drawing, economics, and good citizenship.

It will be noticed that we do not aim to teach the boy to become a mechanical draftsman or engineer, but to give a knowledge which will make him a better citizen and workman.

2d. Pre-vocational course:

This work will be given to children whose parents state that they desire their boys to enter the industries upon completing the 8th grade, or when they have reached the age of 14. The school day will be eight hours, four hours devoted to shop and four hours to school work. The classes will be divided into two sections; one section working  $\frac{1}{2}$  day in the school shop or other industrial work, while the other section will be working at school work.

The school work will consist of industrial mathematics, history, and geography, reading, writing, civics, economics, etc. The shop work will be as general as possible including woodwork, sheet metal work, printing, book-binding, etc. As far as possible, in all these types of work, the group or factory plan will be followed, and useful work will be performed. Very little, if any, of the work, will be exercises as now given in manual training.

A boy who graduates from this course will be able to enter a high school co-operative course should he choose to remain in school.

3d. The co-operative course:

This course which will be a high school course, will give the boy a thorough grounding in high school subjects and an opportunity for him (after he has reached 16) to be gaining an income, and a thorough trade training under commercial conditions as well as an education. Since the boy cannot enter the trades until 16 years of age, the entire time of the first and second years will be spent in school and all the manual training shop work as now given in four years will be taken in these two years. This will give the boy a chance to find himself, thereby allowing him to choose a trade wisely.

The academic work will be similar to that now given in the high school, only it will be based on industrial ideas. Foreign language and all traditional college preparatory work will be abandoned and the time devoted to a more thorough training in English, industrial history, and economics, and such principles and applications of science as are likely to be useful in an industrial career. There will be very little instruction in pure mathematics or science, but instead much time will be given to applied mathematics and applied science, all of which will be closely related to the trade. As far as possible, all instruction, whether English, history, economics, or science, whether in class room, laboratory, or shop, will be designed so as to be useable in the trades the boys are working in.

In the 3d and 4th years, the boys will be "paired" off and one boy will work one week in the shop, where he has chosen to learn his trade, while his mate attends school, and vice versa. The employers will be required by the school to arrange the shop work so the boy will get all types of work pertaining to his chosen trade, so as to turn out a well rounded mechanic. The school, as stated above, will lay particular stress on making the work practical and applicable to the trade. While these courses have been outlined for boys' work, all types apply equally well to girls' work by substituting courses adapted to girls.

At the conclusion of the above paper Prof. R. E. Hieronymous, Secretary of the State Education Commission, gave some timely and instructive remarks on "Conditions Here and Abroad as to Industries and Vocational Training." Prin. F. M. Giles, DeKalb Township High School, next led in the discussion of the subject "Vocational Guidance." Following is an outline of his address:

- I. Need of vocational guidance in the schools.
  1. Increasing complexity of modern industry makes it impossible for the individual to choose without help.
  2. The home cannot give the guidance because in many cases it is not acquainted with more than one or two lines of work.
  3. Drifting into vocations makes misfits and failures.
  4. "Blind alley occupations," chosen without knowledge, make for unemployment and the unemployable.
  5. Brings school in closer touch with industrial facts.
- II. What vocational guidance may include.
  1. General work.
    - a. Survey work with a class for the purpose of giving a point of view.
    - b. School investigations along vocational lines.
  2. Community work.
    - a. Study of industrial conditions of the community.
    - b. Co-operation with employers.
  3. Detailed work with pupils.
    - a. Study of particular vocations and trades with individuals.
    - b. Advice in right selection of courses.
    - c. Help for the pupil who is undecided as to vocation.
    - d. Keeping track of those who have left school.
- III. Division of work between principal and teacher.
- IV. What is being done in some places.
  1. Grand Rapids, Mich.
  2. Decatur, Illinois.
  3. Boston Vocation Bureau.
- V. The work at DeKalb.
  1. General survey work.
  2. Community work.
  3. Detailed work.
- VI. Conclusion.
  1. The work is justified because:
    - a. It helps the pupils to choose more intelligently, and so saves some social waste.
    - b. It brings the school in close touch with industrial conditions, and so tends to make its work more practical.
    - c. It brings the principal in close and sympathetic contact with the pupil and so enables him to plan their work more satisfactorily.

Next followed a discussion on "The Use of Grades as an Aid to the Solution of Administrative Problems." This was introduced by Prin. R. W. Pringle, Lyons Township High School. Mr. Pringle spoke in part as follows:

Although the subject of this discussion is perhaps not vital, I am sure that our chairman is not mistaken in considering it very important and practical. The importance of the subject and its possibilities were made evident by Mr. W. L. Smith's comprehensive paper read in this Conference last year. We are all aware of the importance attached to grades by both parent and pupils. And I am certain that any principal who has worked out a few problems from the grades in his office has learned something about his school that he could not have found out in any other way.

I wish to turn aside for a moment from the subject of discussion as stated to urge the advantage of giving to pupils, at regular intervals, definite marks on their work. I am sure that the attitude of the pupil toward his work is considerably influenced by knowing definitely what is the teacher's judgment of his efforts; it gives

to the pupil with regard to his work a feeling of completeness and certainty which to him is satisfying and stimulating. We are all looking for some sensible news concerning our behavior; and young people are especially anxious to get a definite return for their efforts. Although Arnold Tompkins has spoken to the contrary, I am convinced that Prof. James has shown conclusively the advantage to the pupil from a psychological point of view of furnishing him with this measure of the way he re-acts on the things we require of him in school; the pupil is not fully satisfied and consequently not sufficiently re-assured by a mere "satisfactory" or "unsatisfactory" on his paper or his class work. Like the business man, the athlete, or the captain of a ship, he is looking for something definite respecting the things which so nearly concern him.

To return to the narrower limits of our subject. Some of the administrative problems to the solution of which grades must contribute are the problems of promotion, retardation, elimination, admission to colleges and universities, admission to the high school, and the relative work of the departments and of the individual teachers. Most of the problems have been discussed recently in the educational journals and in meetings of this kind. If there is anything that even seems to be new in what I am to say, it will be relative to the use of grades in fixing the relation between the high school and the grammar school.

There appears to be only two ways of regulating the admission of pupils to the high school—examination by the high school or recommendation by the grammar school. The examination scheme has been almost entirely abandoned. Since giving up entrance examinations, the high schools, like the colleges, have sorely felt the need of more definite information concerning the previous careers of the members of their entering class; and especially do the high schools feel the need of some means of definitely bringing home to the teacher and principals of the grammar schools their responsibility in the matter of recommending pupils. What has just been said of the effect of grades on pupils may be said of the school as a whole; the school needs some pretty definite way of measuring the results of its work and for the same psychological reasons.

This, in brief, is what is being done to meet these needs in the Lyons Township High School. At the close of each school year, the principals of the various grammar schools report, on blanks supplied by the high school, all pupils that they wish to recommend; these blanks call for detailed information with regard to the last year's work of each pupil; this report is supplemented by conferences and written correspondence concerning the individual pupils with the principals and teachers of the grammar schools. As one would expect, the quality of work in the high school, with a few exceptions, ranks the pupils from any particular grammar school the same as they were ranked before coming to high school. Thus the high school knows very definitely what to expect from each pupil. It might be added, by the way, that all high school principals appreciate the advantages of having at hand a full account of the weak pupil's past school career when dealing with parents. This is a by-product of the plan I am describing.

But the grammar school is in need of information even more than the high school. Full bi-monthly reports on the work of first year pupils are sent from the high school to the grammar schools. These reports include the grades obtained in each subject by the pupils, their average standings, and most important, what fifth or quintile of his class each pupil belongs in as shown by his average. Then, by arbitrarily giving to the pupils in the first quintile five points each, to the pupils in the second four points, and so on, to pupils in the fifth quintile one point, it is a very simple matter to assign to each grammar school the place which its pupils have earned for it in the high school; in other words, the quality of preparation furnished by the grammar school and the care taken in recommending to the high school are measured in the high school, and the results sent back to the grammar schools.

This is a ready means of determining the standing of each school relative to the other schools, as well as the rank of each pupil in the entire class. Here, again, the salutary effect of the principles of Prof. James with regard to standings comes into play, only this time the principles apply to the schools. You can readily understand that the principals and teachers of the grammar schools await these bi-monthly reports with some degree of anxiety. The effects indicate that these reports are

wonderfully stimulating; and I am sure that the results to all concerned are much more satisfactory than can possibly be obtained by any scheme of entrance examinations.

Many are the uses that can be made of grades in the solution of administrative problems within the high school; but, for reasons already referred to, I need mention only a few at this time. All teachers should know what is meant by the biological curve and should understand its many applications, as explained last year by Mr. Smith; that is, the principal should see to it that the teacher keeps constantly in mind that there is such a thing as the normal distribution of grades in her classes and that all variations from the normal curve are to be explained. It is helpful for the principal to apply this kind of study to the different departments, as well as to the work of the individual teachers. In what department will the erratic curve be produced?

In the handling of grades for administrative purposes as here suggested, there are a few natural errors that must be guarded against. Much care is necessary in dealing with the pupils withdrawn from the classes and the cause of withdrawals, otherwise the results will be misleading. Then it may be found necessary to guard against the teachers' loading their reports; sometimes when teachers learn that certain things in the way of class averages and grade distribution are expected, they may be too readily forthcoming. In the use of grades for administrative purposes, like any new implement, care and experience are needed.

I trust that this presentation of the subject has shown that our chairman was right in thinking "the use of grades" has a place of some importance in the discussions of this section of the Conference.

This subject was further discussed by Prin. H. E. Brown, of the New Trier Township High School, Kenilworth, who presented some graphs showing the percentage of failure. These graphs were quite interesting and led to the conclusion that marks of grading when well kept through a long period will be helpful in stimulating reaction among those who are failing or falling low in their school work. The discussion of "marks" proved that the teachers are intensely aroused to the importance of a uniform system of giving marks in all schools, by all teachers, and to all pupils.

Following these discussions Mr. Hieronymous described in brief some of the probable school legislative bills that will be before the next session of the General Assembly, especially those affecting the secondary schools of the State.

He offered the following resolution which was adopted:

That this body is favorable to:

1. Vocational instruction in agriculture, commerce, domestic, industrial and mechanic arts.
2. The State should grant aid separate and distinct from and in addition to the present school fund.
3. The creation or designation of a central state authority to administer such aid.

4. Authorizing the local committees to raise such additional amount as may be needed to meet the requirements for vocational instruction.
5. Locally these vocational courses should be under the direction of the school authorities with the co-operation of an advisory board.
6. A further extension of the compulsory school age.
7. Such state aided schools or courses should be intended primarily for children of 14 years of age or over.

After the adoption of the above resolution the section adjourned.

### AGRICULTURAL SECTION.

This section met in room 118, Agricultural Building, with Mr. A. C. Norris presiding and A. W. Nolan as secretary. The general theme for discussion was "Laboratory and Plot Experiments for Secondary Schools." The first paper was read by Professor A. W. Nolan of the University, an outline of which follows:

#### Forest, Orchard and Garden.

#### Outline of a One-Semester Course for High Schools.

#### I. The forest.

##### 1. Principles of general forestry.

- a. Life history of trees, with studies of structure, nutrition and growth.
- b. Influences which affect tree growth, such as temperature, moisture, soil, light, other trees, etc.
- c. Studies of the principal tree species of the community—silvical qualities.
- d. The forest as a tree society, the struggle for existence, and its effect upon development of trees.
- e. Enemies of forest—fires, insects, diseases, bad lumbering, etc.
- f. Influences of forests on climate, water supply, stream flow and soil.
- g. The U. S. Forest Service and its work.

##### 2. The farm woodlot.

- a. The relation and importance of the woodlot to the farm.
- b. Origin, condition and extent of farm woodlots.
- c. Trees as farm crops; comparison with other agricultural crops.

- d. Methods of measuring the wood crops, both in standing timber and in logs.
- e. Woodlot management; how and when to cut trees; what trees to remove and what to leave; methods of improving the woodlot; market lumber; tree planting on the farm; protecting the farm woodlot.

References: Roth—First Book of Forestry.  
 Pinchot —Primer of Forestry.  
 Price—The Land We Live In.  
 Forestry in Agriculture, and other Bulletins of U. S. Forest Service, Washington, D. C.  
 Illinois Extension Circular, "Forest and Orchard."

#### Practical Exercises.

1. Reports of acreage in woodlots on home farms.
2. Practical studies of given woodlots, made in the forest, using the following outline:
  - a. Census table showing name of species, diameters and number of trees..
  - b. Species predominating.
  - c. Age of forest and type of trees.
  - d. Density and condition of the stand.
  - e. Protection given.
  - f. Market facilities.
  - g. General forest condition, nature of canopy, wood mass and floor.
  - h. Suggestions for improvement.
3. Excursion to make forest measurements. Lay off given areas and estimate board feet of standing timber, by standard log rules.
4. Excursions to make and study woodlot improvements. Mark trees to be removed, clearings to make, etc.
5. Planting of forest nurseries on the school grounds.

#### II. The Orchard.

1. Locating and laying out the orchard.
2. Preparation of the ground.
3. Selections of nursery stock.

4. Planting the orchard.
    - a. Preparation of trees for planting.
    - b. Setting the trees.
    - c. Care of young trees.
  5. Pruning
    - a. Purposes and principles of pruning.
    - b. Pruning young and old trees.
    - c. Pruning shrubs and ornamental trees.
  6. Grafting.
    - a. Purpose and principles of grafting.
    - b. Root and crown grafting.
    - c. Top-working fruit trees.
    - d. Budding young trees.
  7. Spraying.
    - a. Common insects and diseases.
    - b. Spraying materials.
    - c. Making spray mixtures.
    - d. Spraying for codling moth and other chewing insects, and for leaf diseases.
    - e. Spraying for San Jose Scale and other sucking insects.
  8. Cultivating orchards. Removing old orchards.
  9. Picking, marketing and storing fruit.
  10. Variety studies, judging, etc.
- References: Bailey—Principles of Fruit Growing.  
 Moore—Practical Orcharding.  
 Waugh—The American Apple Orchard.  
 Purdue Circular, No. 30.  
 West Virginia Bulletin, No. 136.  
 Illinois Extension Circular—Forest and Orchard.

#### Practical Exercises.

1. Laying out an orchard on an acre plot.
2. Examination of nursery stock; pruning roots and forcing tops of young trees.
3. Planting fruit trees—starting a school nursery of apple and peach trees.
4. Pruning practice on old apple trees.
5. Practice in various methods of grafting.
6. Spraying demonstrations.
7. Scoring plates of apples by use of standard score cards.

### III. The Garden.

1. Locating, planning and laying out the garden.
2. Preparation of garden land.
3. Selection of varieties and planting.
4. Planting and thinning.
5. Forcing garden vegetables.
6. Climate, soil and cultural requirements of standard garden vegetables.
7. Combating weeds and garden pests.
8. Small fruits in the garden.
9. Growing flowers and ornamental plants.

References: Bailey—Principles of Vegetable Gardening.  
 Bailey—Manual of Gardening.  
 Williams—Gardens and Their Meanings.  
 Illinois Circular, No. 154.

#### Practical Exercises.

1. Plotting on paper, plans for home and school gardens.
2. Laying out and planting a school garden.
3. Making a hotbed or cold frame and planting it.
4. Special problems or verifications to be worked out by each student or group of students in home garden or in school:
  - a. Variety tests.
  - b. Tomato culture—various systems.
  - c. Methods in potato culture.
  - d. Spraying tests on potatoes, tomatoes, melons, etc.
  - e. Results of various fertilizers.
  - f. Hill and level culture tests.
  - g. Deep and shallow planting tests.
  - h. Deep and shallow cultivation tests.
  - i. Yielding results.
5. Preparation of tables, showing cultural requirements of vegetables.

| Vegetables | Soil Re-<br>quirements | Season Re-<br>quirements | Care Re-<br>quirements |
|------------|------------------------|--------------------------|------------------------|
|------------|------------------------|--------------------------|------------------------|

6. Keeping of a garden diary, recording work done, observations made, and results obtained in garden practice from day to day.

Next followed a paper by Mr. Carl Colvin, of Bloomington, the substance of which follows:

#### School and Home Gardens.

The subject of gardening is one which is broad enough to admit of a great deal of discussion. There are so many points of attack according to the view point taken that not all the ground can be covered in a single paper. It will be a difficult task to make any discussion of the subject so broad as to fit all the problems that come up in the minds of the various teachers in this small group because the environment of the situation in each individual instance has more to do with the actual working of any outlined plan than any other factor. Then, too, there are two distinct problems which are up for solution. First, the one of the rural community which likely is the one which confronts those who are teaching agriculture in the township high school, or those who are attempting high school work in the rural school whether consolidated or not. Secondly, we have the problem of the city high school where the environment is entirely different from that just mentioned.

In the rural community the boy who enters high school work is usually very well versed in the actual working of the garden and the growth of plants though he has a very slight knowledge if not a very much mistaken idea of the principles involved in plant production.

On the other hand, the city bred youngster will probably be making a wonderful discovery when he learns the method of growing sweet potato plants for production of the final product or when he learns that a sandy loam is much better for garden planting than a rich black loam so common in the corn belt. Thus we will necessarily need to begin farther down the scale with the city boy than we should expect to begin with the rural boy. He will probably have a keener interest in the work because he is learning things entirely new. Where classes are divided and have some rural boys and some city boys, another complication arises that throws the balance to one side or the other.

However, in this paper, I shall assume that what is good for the city boy can be applied to the rural class without a great deal of encroachment upon the time of the class, or upon the experience which they have had.

\* \* \* \* \*

It seems to me that in order to merit a place in our already crowded catalogue of high school subjects, a study must accomplish at least two objects or results: First, it must teach something definite and concrete; and secondly, it must possess the cultural side which will make for better citizenship on the part of the boys and girls as they grow to manhood and womanhood.

Our State Superintendent is fond of changing Goldsmith's couplet to read,

"Ill fares the land to hastening ills a prey,  
Where corn accumulates and boys and girls decay."

I believe the test suggested in this little parody should be applied to all our vocational work as it makes its appearance in the catalogues of our secondary schools.

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The garden seems to call out the exercise of the boy's faculties along each of these lines. Every time the attention of the boy is called to the growth of the plant, he must think. Men have been wondering and puzzling over the processes involved in plant growth for years, and yet a complete solution has never been offered. I like to read after Mr. Bailey in his paragraph when he says: "Fill a flower pot with soft dark earth from the border of the wood and carry it to the student of entomology and see if he can name half the living organisms of this little kingdom of life; or hand it to the botanist, well trained in the lower order of plants, and see how many of the living forms which these few handfuls of dirt contain he can classify. Present this miniature farm to the chemist and the physicist and let them puzzle over it. Call in the farmer and ask him what plants will thrive best in it; or keep the soil warm and moist for a time, and have the gardener say of the tiny plants that appear as by

magic which are good and which are bad. Mark what all these experts have said and call in the orchardist to tell you how to change dead, lifeless, despised earth into fruit; ask the physiologist to explain how sodden earth is transformed into nerve and brain." Certainly this tends to prove that the garden study will develop the thinking power of the student if properly given.

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Now as to the cultural value of a garden. What is more beautiful or what lends a greater and more pronounced moral atmosphere to the surroundings than a quiet flower garden or group of shrubs, or growth of vegetables. One may stand by and wonder yet never understand, save that growth is continually going on in this great laboratory of science around us to prove that Nature reigns supreme.

There is this general classification of gardens—the landscape garden, or the garden which is propagated entirely for pleasure and comfort; and secondly, the vegetable garden, or the garden usually raised for commercial purposes. The landscape planting is important from a number of points of view. Nothing can teach the child to love and appreciate Nature more than a good landscape garden filled with shrubs or annuals which blossom and fill the garden, making a complete and unified example of harmony throughout. Let me call your attention to the fact that a garden does not need to be planned and planted by an expert to become a study of interest and source of pleasure.

Mr. Bailey tells the story of his own garden in which he was growing pigweed, ragweed and burdock, and goes on to say that the "value of a garden is not in the plants which grow, but in the appreciative power of the mind which is to enjoy it." The fact that a plant grows should be enough to incite interest on the part of any pupil. He tells of a large burdock plant which grew under his study window and annoyed his gardener so much that he wanted to cut it with the lawn, until Mr. Bailey explained that "far from being a burdock it was a great *Lappa major*;" then even the man who mowed the lawn began to love the plant and showed a high respect for it.

\* \* \* \* \*

We have tried the experiment of teaching the plant growth and general value of planting about the premises, in our classes in high school and the plan seems to work out admirably. By taking trips about the city we have been able to stir up an interest in the pupil in landscape work and I believe it has been of real value as a study. As soon as a boy begins to appreciate, he begins to inquire, and when he asks questions he is usually thinking. The answer he gets to his inquiry will cause him to do more thinking and to interpret his own thoughts. Then the average growing boy will want to do the thing he has worked out in his own mind. After such a lesson innumerable questions come in especially from classes below the high school. After doing work in class in our school gardens boys will ask for instructions as to their own yards and want to know how best to improve them.

This fall our classes planted nearly 5,000 bulbs about the border plantings of our school yards. Previous to this year, the boys have planted shrubbery according to a definite plan, and today there is ample opportunity not only to see and appreciate beautiful plants, but to make a concrete study of them, as individual specimens. Last spring castor bean seed was planted in the back part of the border plantings, and this fall the large plants added very materially to the general appearance of the yards. But this was not all. Three thousand castor beans were distributed among the schools and children from grade to high school planted their own yards. As a result, more than a thousand yards in the city were made more pleasant by the presence of a large imposing castor bean plant. A gold watch was offered to the boy who raised the best plant and a similar prize offered to the girls. This not only aroused the interest of the boys and girls, but the interest of parents and teachers as well. Next year we plan to have a similar contest in connection with the vegetable garden.

Aster seeds were distributed and the city was made a bed of asters during the blossoming season. An aster show is held each fall at which time all the children have opportunity to exhibit their flowers. Some of the high school boys, having gotten enthusiastic over this work while in the grades, have centered their attention

on one or two particular plants, and learned the culture of those individuals. One young man gave so much attention to the work that he is now giving his entire time since graduating, to the raising chrysanthemums for a local florist. Does such gardening pay? To one who has opportunity to see the results there is no question but that it returns a large per cent of interest on the investment. My plan in high school is to develop the scheme still farther to the point where the boy may choose his special subject and develop it in the green-house and pot-culture work.

We find an intense interest on the part of classes in the various school gardens. One principal tells me that her eighth grade boys actually sit up late at nights to keep rogues and animals from molesting a bed of beautiful tulips in front of her school. Some of these boys are now in high school, and show the keenest interest in agriculture. However, there is this to be said about the community garden—the school garden does not beget individual responsibility as does the individual plot. But the common ownership plan works out better in landscape planting than individual plantings. Better unity and coherence in the landscape can be obtained when all work together toward a common end.

\* \* \* \* \*

Let us first of all then give attention during the fall and spring months to the planting of shrubbery about our own buildings. Many boys of our high school classes are in school for the last time. They will soon settle down to permanent work and unless they learn to appreciate plant growth now, they will be losing a more important phase of their education than if they had missed a semester's work in geometry.

We come now to the second division—vegetable gardening. I believe this to be the important phase of the work in high schools because it has in it the training of the child's mind along more lines than the former. He will get the concrete and the cultural, with more emphasis on the industrial phase of the concrete. Vegetable gardening develops skill with the hands, logical work, intensive application, honesty in dealings, business ability, and the faculty of observation.

Before going farther in the discussion, let me make this classification of vegetable gardens: first, the school gardens which may be divided into the common garden and the individual garden; second, the home garden which nearly always falls under the class of individual gardens.

The school garden is an important part of the class work. If we are to get the most out of the study we must use concrete illustrations and do field work. But I am not ready to say that the school garden can justify its existence unless it serves to aid the pupils in their home garden work. It will serve first of all as an incentive to the boys to do home work and secondly as an illustration or model after which they can plan their own gardens. Unless it does accomplish these two objects, I do not believe it will pay to utilize ground and time in making a garden with the high school class. There are many difficulties connected with the school garden which hinder the successful working of any plan of procedure. The time of planting will come before the close of the school year. Preparation of the seed beds and germination and first growth will all furnish valuable material for laboratory work. But the time for observation and lessons in cultivation comes after the close of the school year, so that unless there are summer classes, both the students and the garden will likely suffer. We must assume all through the discussion, of course, that the high school has available ground on which to grow a garden; but even under the most ideal conditions, I believe the school garden is a failure that does not encourage a number of home gardens and aid the student in a material way to raise his standards of work and increase his profits by increasing the value of his products. [There followed illustrations to show the value of gardening in the city.]

I have arranged a number of experiments which I believe to be practicable in the city high school, where a small plot of ground is available. I do not claim first credit for all of these experiments. I have classified the experiments under four heads:

- A. Those illustrating the principles of plant growth.
- B. Those relating to the culture of plants.
- C. Those relating to soil conditions.
- D. Experiments to prevent disease in gardens.

## 1. Seed testing and germination.

## a. Apparatus.

Two dinner plates.

Blotting paper.

100 garden seeds and small microscope.

## Explanation:

Count out all the real seeds and figure percentage of purity.

Then fill one plate with moist sand, lay wet blotter on the sand and place all the pure seed on the blotter, cover with a second blotter, then cover with a second plate to prevent rapid evaporation of moisture and set in warm place.

Take notes every twenty-four hours for four to six days.

Figure the percentage of vital seed.

b. Make actual planting of good seed and inferior seed of the radish and lettuce—planting a row ten feet long in the school garden. Prepare seed bed thoroughly. Determine the rapidity of germination and growth, date of *first* maturity and relative yield of the two kinds of seeds.

What does good seed have to do with the crop?

Numerous questions can be asked from the results of this experiment.

2. a. Root geranium slips and coleus slips in water. Root similar plants in sandy soil in small pots. Watch the root development; how long does it take each to root in water?

Where do most of the roots start?

Compare the sturdiness of the plants after those rooted in water have been put into soil.

b. Take up geraniums in fall and allow to remain in cool dry place through the winter. Set out in the spring along side the plants which have been slipped and grown over winter in pots. Note difference in vitality. What causes the difference?

Why take off lower leaves of slips when starting them to root? How can you tell by looking at the plant, when it is beginning to root?

## 3. Factors necessary for plant growth.

a. Light. Set hardy geranium plants in four-inch pots.

Place one in sunshine and one in dark closet and regulate the temperature and moisture. Note difference in growth. What causes the difference in color.

b. Heat. Same.

Set one plant in warm sunshine and the other in a cold place, either on the north side of the building or in refrigerator. Note differences daily.

c. Food. Same.

Set one plant in clean sand that has been thoroughly washed and allow it to remain for some weeks.

Set another in rich sandy soil and note difference in growth.

d. Air. Same.

Saturate the soil in one pot with water to exclude the air.

Set the other plant in coarse sandy loam. Note differences in growth. How long will the plant live without air?

e. Moisture. Same.

Set one plant in a pot of soil that has been air dried. Compare with the plant which is growing in moist loam. How long will the former live?

Set a bell jar over a plant growing out in the garden and note the collection of moisture. Where does it come from? Study data at hand giving amount of moisture required by different crops.

## B. 1. Effect of tillage.

## a. Apparatus.

Bed of good garden soil 3' x 12'.

Tested lettuce seed.

Spades, rake, hoes.

## Explanation:

Divide the bed into four equal parts—cutting it cross-wise and allowing space for path between beds. Number the beds from one to four.

Prepare seed bed in Nos. 1, 2, and 3, thoroughly. Allow No. 4 to remain unprepared except the removal of weeds.

Plant lettuce seed in rows six inches apart so plants will stand six inches apart in the rows.

Till bed No. 1 every two days to a depth of six inches.

Till bed No. 2 every two days to a depth of one inch.

Simply keep weeds cut from No. 3.

Allow No 4 to grow unmolested.

b. Note comparative results every four days according to a definite outline bringing out the following points:

Date of planting.

Date of first appearance of plants.

Date of first lettuce for table use.

Comparative size of plants.

Quality of product.

2. Forcing plants and hot-bed planting.

a. Apparatus.

Hotbed.

Flower pots of two sizes.

Cold frame.

Garden tools.

Explanation:

Prepare the hotbed and get it in shape early. Good directions for making a hotbed may be found in "Bailey's Manual of Gardening" or in United States Bulletin on "School Gardening."

Plant cabbage and tomato seed in hotbed early in February.

Transplant March 1st to four-inch pots and keep in hotbed to grow.

Transplant four weeks later to six-inch pots and allow to grow until April 20th, when the plants may be set in cold frame. Set plants into the garden as early as weather and soil conditions will permit.

Take up the whole plant together with the soil held by the roots and set in a large well soaked hole in the garden.

Plant seeds about April 1st in hotbed and do not thin plants to encourage extra growth. Allow them to remain in hotbed until time of planting in the garden.

b. Note in each case:

Wilting of plant when first set.

Rapidity of growth of plant.

Date of first fruit.

Quality of fruit.

General sturdiness of the plant.

While this experiment may not prove to be practicable in many gardens, yet the student can apply the principle involved in all his garden work. Surprising results are obtainable if careful watch is taken. Most of the plants' growth will come before school closes so the child may see the difference in development of the plants during the first few weeks which is the important stage in the plant's development. The same experiment may be tried using radishes and other small vegetables which will develop before the close of school.

C. Apparatus: Ordinary garden soil, garden tools and good horse manure.

a. Put manure on a bed, three feet by six, early in the spring.

Allow a similar bed to stand with no application.

Work up seed bed in each, early and plant to radishes and lettuce.

Record notes every two days. Note differences in growth, color of foliage, root development, vegetative growth, and yield of product by weight. If possible, analyze a sample of the manure applied to determine the kind and percentage of food applied.

b. Apparatus: Same.

Add bone meal to one bed and nothing to the other. Note same factors.

c. If soil is acid (test with litmus paper) apply limestone and compare with check plot.

#### D. Apparatus:

Garden plots, tools, and one-half bushel potatoes affected with scab. One pint formalin, thirty gallons water and tub.

a. Treat one peck of the seed with solution of formalin. Be careful not to allow any opportunity for re-infection.

Plant treated potatoes in one plot and untreated potatoes in another plot preferably in another garden close by.

Note differences in the growth of the plant and take measurements of potatoes produced in the fall. Calculate cost of treating one acre. What would be the gain per acre of treated over untreated?

b. Treatment for potato blight can be carried on by spraying with bordeaux mixture. Treatment for insects can be carried on through the summer.

In regard to plot culture work and extensive work in methods of building up the soil either in connection with garden work or crop production, I will say that I do not believe it to be practicable. Usually there can be no provision made for summer maintenance of crop plots and students cannot do the work required without direct supervision. High school classes do not have sufficient knowledge of chemistry, botany and physics to appreciate plot culture experiments only in the most elementary form. Some pot culture work might be done in green houses, but even if the student has had his first three years of high school work, he will not be able to do work in soil fertility extensive enough to carry on large experiments in pot cultures.

There is so much valuable information to be gotten from a study of the plot work done in our state fields that I believe where possible the class should be taken to one of the fields and a month's time given in the fourth year's work to the study of the data from this particular field. Plot experiments must continue for years before the data is of very great value to the student and this element alone will make it almost impossible to do successful plot work even in gardening. This phase of the study is not so necessary in connection with garden experiments in as much as soil conditions in the ordinary gardens are generally above the average.

I have attempted to make these experiments suggestive and would continue the work under each head as far as time would permit using various plants.

\* \* \* \* \*

In closing I wish to reiterate the statement made in the beginning of the paper that all work should be directed so as to bring out the cultural as well as the concrete. In other words, I believe that Dr. Rogers struck a key note when he stated that vocational education in order to merit a place in our schools should build up the body and mind and prepare the student not for a living but for a life.

A full discussion followed; then two papers in which the sentiment expressed favored the carrying out of lines of work as outlined by the speakers in our high school courses.

Two papers made up the afternoon session. Abstracts of these papers follow:

#### Cereal and Forage Crops.

#### A. J. Beatty, Geneseo, Illinois.

I was somewhat surprised to be invited to lead in this discussion, for I am not a graduate of an agricultural college, nor an instructor in agriculture in our high school. However, I am very glad for the honor conferred upon me and also very glad for the information which has come to me in the preparation of this discussion.

I was asked to report here what is being done at the Geneseo Township High School, and to formulate from our work a number of laboratory and field experiments suitable for use as a laboratory manual on cereal and forage crops.

The work being done at the Geneseo Township High School under the direction of Mr. Claycomb, while we believe that it is equal to any being done in other high schools in the state, is not developed fully enough to have any claim as a model high school agricultural department.

In order that I might be better able to present to you what is being done in the best high schools having a department of agriculture, a questionnaire was printed and sent out to nearly 100 of the best high schools in our own state as well as in Wisconsin, Iowa and Ohio.

Personal letters were sent also to the superintendents of agricultural extension in these states, asking for a list of the high schools where the subject is being taught best, and upon receiving replies, letters were sent asking the schools named for their courses of study, and a description of their plot work, and especially asking for laboratory notebooks, which, of course, I agreed to return.

My quest for data was somewhat discouraging, though a very large percentage of those addressed answered promptly.

Only four schools were able to send printed courses of study, and I was unable to secure a single laboratory note book.

Some of the facts brought out by our questionnaire are worthy of mention.

1st. The average time given to the study of agriculture is considerably less than two years.

2d. Many of the best high schools of the state, even in agricultural districts, are doing no work in agriculture, showing that school men, as a rule, have not yet fully awakened to the necessity of this work. (Such a conclusion seems hardly justified. Editor.)

3d. Not more than half of those having a course in agriculture have any experimental grounds.

4th. The sentiment in about half of the communities is reported as indifferent or unfavorable.

5th. The enrollment in more than half of the schools is made up of more than fifty per cent of town pupils, showing that the farmer boys and their parents practically do not admit that the agriculture work in high schools is worth while.

6th. Inability to secure satisfactory instructors was given in several replies as the reason for no agriculture work.

These facts seem to warrant the conclusion that there is much room for missionary work in this field.

The reports show that nearly all schools having this work are experimenting with corn, wheat, oats, clover and alfalfa. Very few of the schools are studying any other cereals or forage crops.

The inability of instructors to send me printed courses of study indicates very forcibly the experimental stage of this work. No one seems to be sure that what he is doing is really the right thing, or the best thing to do, and very few seem to be doing the same things.

I am not sure that this is not a good indication, for it shows that the men interested in this work are alive, and are working out plans which will eventually lead to a definite course of study.

Since the majority of high schools are offering not more than two years of work, my suggestions are based upon that amount of time, divided into four kinds of work:

1st. Text book study and class recitation.

2d. Field work, note books in hand, followed by class recitation for discussion.

3d. Laboratory experiments and pot cultures.

4th. Plot work.

The division of time for the various kinds of work should be approximately one-fourth to each, with perhaps somewhat less on field work and more on laboratory and pot culture. I may be somewhat unorthodox, but I favor a large number of experiments simplified as much as possible, and stripped of some of the red tape of ordinary laboratory precision, for at the present stage of the agricultural work in our high schools, it is our duty to popularize the work in the laboratory, rather than to attempt to determine exact mathematical results.

The time will doubtless come when agriculture laboratory will become firmly established and then more detailed work can be done, but this time is not yet. The large number of pupils who wish to begin this work are from the country schools and have not had the advantage of preparation thorough enough to enable them to do work of a highly scientific character.

It is difficult to see how any very great success can attend our school plot work as now conducted in many of our schools, for the most valuable part of the season, when the crops are growing and need most attention, is just when the schools are not in session.

I believe that a much greater degree of success and usefulness can be obtained from home plots, for there the plot can have all the summer attention of the pupils.

We have had several of these plots at Geneseo during the past year and though not as successful as might have been hoped, were fully as successful as the school garden plots.

These home plots were planted to corn or potatoes, standard varieties being planted, and prizes were offered for the best corn and potatoes raised.

(The above was followed by a long list of experiments which it does not seem necessary to print here.)

### The Dairy.

Professor Charles H. Keltner, Mt. Morris, Illinois.

In order to learn how much attention is being given to dairying by the teachers of agriculture in the high schools of Illinois, the author mailed letters of inquiry to as complete a list of teachers as could be secured and nineteen replies were received. While it is not wise to attempt a statistical report of such an inquiry, yet it seems safe to conclude that not a great deal of attention has been given in this state to the study of this subject.

The Superintendent of Schools in Edgar County, reports that the Babcock test is performed in a number of the schools under his supervision and it is probable that exercises with the same kind of apparatus are performed in some schools from which I have no report. Of the high schools which reported, more than half have not attempted any work in this subject; all of the remainder are using the Babcock test. DeKalb Township High School offers a regular course and Mr. E. B. Collet, the teacher, is studying the problems of teaching the subject with commendable thoroughness and spirit; the John Swaney School gives twenty weeks to the subject, but the teacher believes that twelve weeks is sufficient time for the needs of his community; Harlem Consolidated School, through the efforts of Mr. C. C. Burns, the principal, gives helpful instruction and renders valuable service to the patrons; Rockford High School offers work in dairying as elective in the courses of chemistry and household science. A few schools are attempting work in the judging of dairy cattle.

Mr. Burns, at Harlem Consolidated School, reports as follows concerning a line of study which he has attempted:

"The milk from every cow in every herd from the children's home is weighed and tested. In order to do all this, the milk from each cow is weighed night and morning for three days in every month. The weights are kept on a sheet and board which are sent from the school and brought back at the end of the period. Milk scales are also supplied where there are none at home. These records are entered upon a big complete record sheet at the school. The milk is also tested for per cent of butter fat and the value of the butter which could be made therefrom is computed. These records are recorded and any remarks of importance are noted."

This school is not located in an important dairy section of the state, but I venture to assert that a few years of this kind of teaching will be of sufficient service to the community to cause the weeding out of many of the unprofitable cows from the small herds as well as the stimulating of interest in the dairy industry.

At the time that the above mentioned inquiries were mailed, others were sent to principals of schools in Minnesota and Wisconsin, the parties having been recommended to me by the Superintendents of Public Instruction in these states. In Minnesota, agricultural work in high schools has been taught for only a short time.

So, with the exception of an outline of study from Lewiston, very little helpful information was received. From Wisconsin, however, I received courses of study from five schools and from the Dunn County School of Agriculture and Domestic Science a list of laboratory exercises in dairying was obtained. If I may judge from the evidence at hand, I am forced to conclude that work in this subject is thoroughly done in some of the county agricultural schools in Wisconsin.

In view of the fact that milk is one of the most largely used human foods whose solids have a very high per cent of digestibility and, since at the present time of high cost of living, it is one of our economical foods, it seems to me that more time should be given to the study of it and its production. High school students who will pursue this line of study will be sure to acquire valuable information which will be a benefit to them and a profit to the milk producing industry. We need not only dairymen who know how to produce sanitary milk, but consumers who are well enough informed on this subject to prefer this kind of milk. Sanitary milk costs more and its production cannot be profitable until people learn to discriminate in favor of it.

Dairy work in our high schools is an urgent need. Professor Frazer has stated to me that there is much work which a student may do in the average high school laboratory which is sure to aid in creating a demand for pure milk. Professor Hugh Van Pelt, the Iowa dairy expert, has written me as follows concerning this subject:

"The study of dairying in our high schools can certainly be made of real value to the dairy interests, and as a matter of fact, great improvements will necessarily come by way of teaching agriculture in our high schools."

It is becoming less difficult to teach the subject because there are more helpful books available than there were only a short time ago. I wish to mention the following:

Milk and Its Products, Wing, MacMillan & Co.

Dairy Cattle and Milk Production, Eckles, MacMillan & Co.

Farm Dairying, Rose, A. C. McClurg & Co.

Business of Dairying, Lane, Orange Judd Co.

Testing Milk and Its Products, Farrington and Woll, Mendota Book Co., Madison, Wis.

Van Pelt's Cow Demonstration Book, Kimball's Dairy Farmer, Waterloo, Ia.,

U. S. Dept. of Agriculture Bulletins.

State Experiment Station Bulletins.

Literature from the Different Dairy Cattle Associations.

The subject matter of a high school dairying course should be chosen with a view to satisfying the needs of the community in the best manner possible. In high schools which offer agriculture for the instruction of young people from the country the work must be different from that which is intended to benefit those persons who have been reared in the city and will probably make their home there. Country people need to learn how to produce sanitary milk and how to secure the greatest returns possible from the equipment which they have. City people should be taught concerning the value of clean, pure milk and how to take care of it.

There are some laboratory exercises which may be performed by students in both classes of schools. Among them are: 1. The Babcock test of milk and cream.

2. The determination of the total solids. 3. The judging of dairies.

For city high schools the following, in addition to the above, are suggested:

4. The examination of milk for sediment. 5. Hydrometer and lactometer tests.

6. Pioscope tests. 7. Tests for preservatives. 8. Tests for starch in ice cream.

9. Determination of per cent of fat in cheese.

In those schools which serve the country communities these exercises may be used: 4. Judging dairy cattle. 5. Organized effort in weighing and testing of milk from individual cows in patron's herds. 6. Babcock test of skim-milk; study of the local problems of feeding and production.

Specific directions for the study of a number of these exercises are given below.

### Directions for the Babcock Test.

Utensils—1 17.6 cc glass pipette, 1 17.5cc acid measure, 2 Babcock test bottles.

Caution—Sulphuric acid should be handled with care. It is corrosive in its action, and when it comes in contact with wood, clothing or skin it is injurious.

Procedure—Clean and drain all utensils. Before you take samples of the milk which you expect to test, pour it from one vessel to another five or six times in order that it may be of uniform composition throughout. Insert the small end of the 17.6cc pipette into the milk and, with the other end in your mouth, draw up milk until it rises slightly above the graduation mark. Now hold the milk in the tube by placing your finger over the upper end, and then cautiously let the milk out of the pipette, drop by drop, until the lowest part of the curved upper surface of the milk column is at the graduation mark on the pipette, when the latter is held in an upright position. Carefully insert the pipette into the milk test bottle, holding the bottle in an inclined position so that the milk may run down and the air escape without bubbling, remove your finger and empty the contents of the pipette into the test bottle, taking care to have it entirely emptied. Fill the other test bottle in the same manner.

The acid measure should now be filled with commercial sulphuric acid up to the 17.5cc graduation mark. By adding only a small quantity at a time, pour the acid into one of the test bottles into which you have placed a sample of milk. The acid in combining with the milk causes the mixture to be changed to a dark chocolate color and to become quite hot. Mix thoroughly by gently revolving the tube. Proceed in the same manner with the duplicate sample.

As soon as the second sample is ready, place the bottles upon opposite sides of the centrifugal machine; but, if the bottles are not hot, heat them first by setting them into hot water. Turn for five minutes at the rate suggested in the direction accompanying the machine. Remove and fill each bottle with hot distilled water (or rain water) up to near the top of the graduated scale but not above. Again place the bottle in the machine and turn for one minute. Remove the bottles and notice the fat which should have collected within the graduated portion of each. The difference between the readings of the highest and lowest points of the column of fat is the percentage of fat. Read at once.

Notes—The presence of white particles within the column of fat may be caused by your failure to add enough acid or by the using of acid that is too weak.

The use of too much acid or that which is too strong is liable to cause the presence of charred particles.

### Total Solids.

Utensils—2 aluminum milk dishes, 1 5cc pipette, 1 desiccator.

Procedure—Clean all utensils thoroughly. Place the cleaned dishes in the 100° oven and heat for at least thirty minutes. Remove and cool in the desiccator; then weigh.

Mix the sample thoroughly by pouring it from one vessel to another six times and then with the aid of the 5cc pipette place 5cc of milk in each aluminum pan. Evaporate to dryness on a water bath and then heat in the 100° oven for one hour. Cool in the desiccator and weigh quickly to prevent the absorption of moisture from the atmosphere. Return to the oven and heat again for thirty minutes. After cooling in the desiccator, reweigh. If the weights of the second weighing correspond closely with those of the first, you may feel reasonably sure of your data. If there is much difference it will be necessary to heat again and reweigh.

In addition to a record of your manner of procedure your note book should contain a record of the following:

|  |       |
|--|-------|
| Specific gravity of the milk from which sample was taken (Ex.) | ..... |
| Weight of 5cc.....   | ..... |
| Weight of pan.....   | ..... |
| Weight of 5cc and pan.....                                     | ..... |
| Weight of dry milk and pan.....                                | ..... |
| Weight of dry milk (total solids).....                         | ..... |
| Percentage of solids.....                                      | ..... |

In company with their teacher, students should visit several of the dairies that are accessible. In order that the inspection may be thorough, the use of a score card is recommended. (A score card was recommended for use in the inspection but this is omitted here.)

#### Specific Gravity.

Utensils—Hydrometer jar, hydrometer, common lactometer, Quevenne lactometer.

Procedure—Clean the utensils. Mix the sample of milk by pouring from one vessel to another and then pour into the hydrometer jar. If the temperature of the milk is not near 60 F (15.6 C), set the jar into a vessel of water and warm or cool to the desired temperature. Then float the hydrometer. The line of contact between the surface of the milk and the hydrometer shows on the scale the specific gravity of the sample. Record your readings.

Using the same jar, float the lactometer in the milk and read. You will note that this instrument has a scale of 120 equal parts. The zero point marks the specific gravity of water and "100 corresponds to the assumed least specific gravity of milk, or 1.029." Record in your note book.

Now determine the specific gravity as obtained by the use of the Quevenne lactometer. You will notice that this instrument is graduated from 15 to 40. The reading of 29 on it is identical with 100 on the ordinary lactometer and with 1.029 on the hydrometer. Record in your note book.

#### Test for Preservatives.

Borax or Boracic Acid—Secure from your instructor a sample of milk to which boracic acid has been added and acidify by adding a few drops of hydrochloric acid. Then suspend a strip of turmeric paper in the milk in such a position that the line of contact with the surface of the milk is about one inch from the top of the paper. Examine after several hours and note the bright red coloration of the paper near the surface of the milk.

In order to note the delicacy of this test, repeat by using another sample which the instructor will supply. This one contains boracic acid in the proportion of one part of acid to 10,000 of milk.

Secure from your instructor three samples of milk and test each in the manner which you did the above ones.

Record in your note book your method of procedure as well as the conclusions concerning the character of the last three samples.

Formaldehyde—Place the sample of milk which contains this preservative in a medium sized test tube, filling the same not more than half. While the tube is being held in an oblique position, slowly add commercial sulphuric acid, allowing it to run down the test tube and collect beneath the milk. As this takes place, carefully watch for the appearance of a violet coloration near the line of contact between the milk and the acid.

Note — In case the acid which you use is pure instead of commercial, add a small quantity of ferric chloride.

Secure three samples from the instructor and test each for the presence of formaldehyde.

The record which you make in your note book should include an accurate description of your manner of testing for formaldehyde and a report of your findings when you tested the last three samples.

#### Pioscope Test.

Utensils—Heeren's Pioscope.

Procedure—After securing at least four samples of milk, make the test with the pioscope in the manner directed below. Proceed by placing a small drop of milk upon the small central disc, covering it with the glass plate and comparing the color of the drop as it then appears with that of the small sample areas which surround the disc.

Record in your note book the character of the samples which you have examined.

Professor A. W. Nolan described the work of the National Society for the Promotion of Agricultural Education, and moved that this section become the Illinois Division of the National Society. The motion prevailed and Mr. A. C. Norris was chosen president, and Mr. A. W. Nolan, secretary.

#### BIOLOGY SECTION.

##### *Forenoon Session.*

Meeting called to order by the chairman, Mr. T. W. Galloway, about nine o'clock.

The following program was given:

"A Symposium on Successful Methods of Securing Particular Results in the Teaching of Biology." The object of this session will be to bring before the section special exercises that have been devised by teachers of elementary biology for the purpose of securing certain definite kinds of reaction from their pupils.

There will be a series of brief papers, each of which will include (1) a statement of the special object of the exercise; (2) the method used in accomplishing this object; and (3) an estimate of its success in practice.

#### I. Reports of Exercises. (Limited to 12 minutes.)

1. How to Introduce the Pupils to the Literature of Biology.  
Prin. G. J. Koons, Murphysboro Township High School.
2. An Exercise to Impart Useful Knowledge in Botany.  
Mr. J. L. Pricer, Normal University, Normal.
3. The Use of Economic Insects to Arouse the Interest of the Beginner in Zoology.  
Mr. J. P. Gilbert, Carbondale Normal School.
4. An Exercise in Botany of Humanitarian Value.  
Miss Celestine L. Rice, Decatur High School.
5. An Exercise to Induce the Application of the Scientific Method to Life Problems.  
T. W. Galloway, Decatur, Illinois.

#### II. Discussion of the Proposed Exercises.

Professor Otis W. Caldwell, University of Chicago.  
Miss Ada Weckel, Oak Park and River Forest Township High School.

General discussion.

*Afternoon Session.*

Meeting called to order about 2:30 by Professor H. B. Ward, Acting Chairman.

A report of the commission on syllabus was made by Mr. T. W. Galloway, chairman of the committee. A printed copy of the syllabus was placed in hands of each person present at the meeting.

Each of the other members of the committee on syllabus was called upon to make comments on the syllabus.

A general discussion of the syllabus then followed.

A motion was made, seconded and carried, to accept the report of this committee on syllabus, to approve its work, and to have this same committee proceed with an elaboration of the syllabus presented and to construct one for the subject of botany for consideration at the next year's meeting, for the one prepared for this year's meeting dealt only with zoology in high schools.

Adjourned about four o'clock.

T. L. Hankinson, Secretary.

Following are given papers and abstracts of papers read at the sessions of this section; also a full copy of the syllabus as adopted.

### How to Introduce the Pupils to the Literature of Biology.

G. J. Koons, Murphysboro, Illinois.

The first thing necessary in introducing the pupil to the literature of biology is to have a supply of reference books that are really worth while—books that are both interesting and authoritative in their treatment of the subject.

The pupils may be interested and stimulated to read and appreciate the literature of biology by: 1. Informally talking with the pupils about books and their authors.

2. Judiciously making arrangements for reading.
3. Using reference books with the pupils; thus by example leading to their use by the pupils.
4. Assigning special topics or problems to be worked up which require a considerable amount of reading.

### An Exercise to Impart Useful Knowledge in Botany.

J. L. Pricer, Normal.

Subject matter: The morphology and physiology of the leaf.

Method: A mixture of lecture, demonstration, text book, quiz, and laboratory study.

Dominant aim: To impart effectively definite knowledge of the subject matter.

Secondary aim: To impress the pupils with the method of the subject.  
Discussion:

In the teaching of any science and in almost every lesson in science, we must have a double aim in mind. We must endeavor to put the pupils in possession of a certain subject matter and we must seek to train them in the use of the scientific method. Since, as I see it, it is impossible for us to serve equally well, at the same time, these two masters, we are constantly faced with the necessity of deciding which of these two aims should be made dominant. If we make method the dominant aim, we proceed slowly, we cover little subject matter, and we show by our own attitude that more importance attaches to the method by which a fact or principle is approached than attaches to the fact or principle after it is reached. If our various lessons are arranged primarily in the interests of training in the scientific method, the subject matter is likely to become broken and disjointed and the pupil's knowledge of the subject will lack unity and definiteness. If on the other hand, we make knowledge the dominant aim, we may treat the subject matter connectedly and with fullness and definiteness, but we are obliged at many points to neglect the interest of training. I am aware that much of current pedagogy maintains that training is well nigh all important, that knowledge should be almost always secondary, and I grant that this may be true in some subjects like Latin and mathematics. I am aware, also, that some students of pedagogy claim that if we seek training first, knowledge will be added thereto in the most efficient manner, but I question both of these statements in their application to the teaching of science. It is wholly for the purpose of raising this question that I have selected this exercise for discussion. I have only space here to state my position on the question, almost without discussion.

In the first place, the subject matter of science has an intrinsic value far greater than that of most other branches of learning. I believe that it is knowledge of scientific facts and principles and prejudices based on such knowledge more than it is habits or methods of thought that determines our adjustment to the situations that arise in the affairs of every-day life. I also believe that we do not forget knowledge to the extent that many claim. We may not be able to recall at one time much of the detail of a course that we had several years before, but if the knowledge is well fixed at the time it is acquired, it will usually be found in working order whenever a situation arises in after life that demands its use.

In the second place, I do not believe that much efficient training in the use of the scientific method can be accomplished in any branch of science until the pupil has had more or less of a bird's-eye view of the subject; until he knows something of the limits and bounds of the subject and is familiar with some of its fundamental principles.

These considerations and others lead me to conclude that in most lessons throughout a beginning course in botany or zoology, the knowledge aim should be made to dominate and that methods and devices should be selected accordingly.

In the matter of interest on the part of the pupil, I believe that opening up the rich and inspiring subject matter of botany and zoology as rapidly and effectively as possible, is more likely to be effective than to put the pupil through a course of training that is intended primarily to prepare him to master much of this subject matter for himself later. We are often told that the old natural history of former times was considered intensely interesting by students and it was taught largely for its knowledge content. This leads me to wonder if some of the reported lack of interest in science today is not at least partly due to our expensively equipped laboratories and our double laboratory periods in which many of us are making miserable failures in our efforts to train in the use of the scientific method. On the other hand, is it not possible that we might succeed a great deal better if we should return to something a little like the natural history method with the much richer and more vital subject matter that we have today?

## The Use of Economic Insects to Arouse the Interest of Beginners in Zoölogy.

J. P. Gilbert, Carbondale, Ill.

For the purposes of this brief discussion, I shall use the term "Economic Insects" to mean those Hexapoda which cause the loss of property or spread disease.

In infancy, interest centers around self and all the objective world is made to move about that center so far as the infant is concerned. Education is in large measure occupied with bringing about an evolution from the egotistic to the altruistic in the individual. By the time the youth has reached the high school age, the adolescent period, this evolution has proceeded until the pupil is gravely concerned as to the welfare of somebody outside of self. Still he thinks largely in terms of human interest of the economic sort. Every experienced high school teacher knows how anxious his pupils are to get out of school and earn money. To curb this economic desire and keep the boy in school is one of the large problems of high school administration. We find in pupils of this age little regard for pure science, for knowledge for its own sake. This latter state of mind is the result of long training of mature minds. It is the finished product of scientific training and not the initial cause of search for scientific truth. The high school pupil therefore frequently develops a strong aversion to the training we attempt to give him, because he can see no connection between the things we teach and the life he plans to lead.

Hence that large number of students who enter our classes in zoology without having had any previous direction as to the economic aspects of animal life, usually begin either with no interest in the subject or with a positive dislike for it. This number has always been very large in my own classes. To offset the positive disadvantage of such an initial condition, I am strongly emphasizing economic insects with the classes which begin the study in the fall term. Among the advantages of this practice, not the least is that the materials for study are always abundant and easily accessible at this time of the year. Early in the term we go afield where we search larger bodies of water, small streams, stagnant pools, and old cans, pails, and rain water barrels in rear yards for mosquito larvæ.

Every student knows that the mosquito tortures people and frequently unfits them for business, even regardless of the malaria spread by the *Anopheles* mosquito. It is usually with considerable surprise that the students learn that the larvae are rarely found in ponds or larger bodies of water, or in running streams, but that most of them are bred at our own doors. We then bring in a few small sun fish or minnows and by feeding them the larvae discover what would happen to the wrigglers if they were hatched in ponds or streams. Students then take some larvae which are newly hatched, separate them out into several jars and try the effect of various amounts of food supply upon their period of development. They have found that larvae having plenty of stagnant water in which to feed reach full size in about eight days, while others of the same age with a diminished food supply were kept in the laboratory as larvae for five months. In this particular case the four survivors died by accident. This clearly illustrates the part played by stagnant water about premises in producing quickly a large crop of mosquitoes. We throw living larvae on the screen from a small aquarium by micro-projection, and by placing a drop of kerosene over the water, we are enabled to watch upon the screen all the details of extermination by the use of oil. Other methods of extermination and prevention are discussed and the method by which the insect spreads malaria is explained. Methods of distinguishing between *Anopheles* and *Culex* larvæ and adults are made clear. A similar investigation of the house fly or "typhoid fly" follows this study. The breeding places are located, the life history studied and the adaptive structures and habits for spreading filth and disease are made clear.

At Carbondale, we take advantage of the unusual opportunity to study the corn-ear worm which is extremely abundant and destructive there. The nature and extent of injury in the tips of ears are made out. Less injury is found in early maturing corn, but even ripened corn is fed upon until hard freezes stop their operation. The class this year found an interesting result upon some corn plots on our demonstration farm. These plots had been given various soil treatments for demonstration purposes. On an untreated plot, out of 200 ears the ratio of sound ears to

injured ears, was 2.41:1. On the adjacent plot which had been treated with manure, rock phosphate and ground limestone, having practically the same number of ears the ratio of good ears to injured ears was 4.84:1. Every student is anxious to know whether this was mere accident or whether it was the result of greater vigor and resistance upon the part of the corn on treated land; or whether it was due to the earlier maturity so evident upon the treated land plot. In view of the greater proportion of sound ears in plots given other soil treatment, the "accident theory" is of doubtful value. At any rate the results were intensely interesting to the students, and it helped to place them in the attitude of experimentation and research. I am sure they would like to investigate the question farther.

In studying the mouth parts of insects, we compare the type found in locust, caterpillars, etc., with the suctorial type of the Hemiptera.

The methods of fighting mandibulate insects such as the potato bug with stomach poisons spread upon the foliage, is brought out in striking contrast to that necessary to eradicate aphids, scale insects and many other suctorial insects where contact poisons are made necessary by the type of mouth parts.

The nature and extent of injury and the methods employed in fighting the pests and why these particular methods are used always arouse a keen interest among members of the class. The interest is judged by the attitude of students in class room, laboratory and field, and by their outside reading, collections and observations.

If the instinct of curiosity which is so overmastering in the child could be fully gratified by parents and grade teachers with a wealth of scientific knowledge, students might come to the high school with keen interest in zoology. But they do actually come frequently dulled by their training and lacking in interest for animal life. This interest must be quickly supplied unless we are to lose valuable time. In my estimation, nothing is more available or effective than economic insects for arousing the interest of the beginner in zoology.

### An Exercise in Botany of Humanitarian Value.

Celestine L. Rice, Decatur, Ill.

The exercise as conducted made use of an actually felt need, on the part of the pupil, for ability to use plants to a definite end. This end interested the pupil and appeared to him, as well as the community at large, to be worth while.

The execution of the problem, "Planting the School Grounds," required sustaining interest in a particular piece of work for a considerable period of time. The ability to give pleasure to others than one's self functioned in the efforts of pupils. Solving such questions as what, where, when, and how to plant led to observations being made upon parks, gardens, etc. where successful planting had been performed. Rules operating to produce artistic effects were noted, namely: (1) Avoid planting in straight lines: (2) Plant in masses: (3) Group plants for foliage effects: It interested the pupil to know that he could make his own back yard attractive by the proper use of shrubs and vines. Limited funds necessitated wise choosing that best values might be realized for the money expended. Definite plants considered with reference to their ability to meet certain requirements in solving real problems afforded material for technical botany work, such as functions and structure of plant organs and the identification and classification of plants.

Evidences that the exercise was successful:

- (1) Thinking was done about things of common life.
- (2) A genuine problem growing out of the needs of community was solved.
- (3) In solving this problem interest and responsiveness on the part of the pupil were shown in his willingness and ability to
- (4) Raise and solve problems.
- (5) Certain of these problems involved the understanding of the functions and structures of plants.
- (6) Finally, practical knowledge of how to use plants to a particular end was gained, as was evidenced on the part of the students towards beautifying their home grounds.

## An Exercise to Induce the Application of the Scientific Method of Life Problems.

Professor T. W. Galloway, Decatur.

I give my adherence to the view that the prime purpose in most of our teaching is not information—except in certain subjects that are chiefly tools or implements of progress. I consider that the prime results are rather a certain alertness of interest, appreciativeness of attitude, willingness to think independently, power of getting right conclusions and of acting sanely and exactly upon them. Knowledge to be sure enters into all this, but not in the way we sometimes imply in our teaching. It is the raw material; but the process, the finished products in the form of conclusions, and the by-products in personality are our big ends, it appears to me.

Some years ago I presented to the Central Association, a little series of introductory exercises which are devised to give the high school student some appreciation of the normal mental processes involved in passing from common observations of facts to the drawing of general conclusions from these facts. These exercises deal with sand, pebbles, crystals, shells, etc., things with which the student is already so familiar that he need not confuse his processes through the newness or strangeness of the phenomena.

The order of processes suggested there, as making up the scientific method are:

1. Observation and exact record of the qualities or characteristics of an object.
2. Comparison of the observed qualities of the object.
3. Classification of the qualities of the object on the basis of their seeming similarities.
4. Discrimination of the essential from the unessential qualities of the object.
5. Comparison of various objects on the basis of their qualities.
6. Classification of objects on the basis of their essential qualities.
7. Definition of these classes of objects.
8. Statements of general conclusions, or truths.
9. Retesting of conclusions on basis of more extended observations, etc.

I consider it very valuable for the student to take all of these steps *consciously* and *knowingly* a few times—not that we need to distinguish them ordinarily in practice; but unconsciously formed errors of method are not corrected otherwise than by conscious attention, as a rule.

I usually give 5 or 6 double periods to the working out of this problem with my academy class early in the course. I have never found any thing the students seem to enjoy more, nor which proves so stimulating to them. It is made the occasion for a review of the facts of the physiology of the senses, something of the nature of sense perception and its contribution to us.

In recent years I have felt that it is possible to make this method of science take a little deeper hold on the consciousness of the pupil. It is not enough to make him *see* the scientific method and to apply it to the materials of botany and zoology in the laboratory. We are really seeking to secure his adherence to the view that he ought to *use* this method in all his decisions and generalizations in practical life, in so far as it is possible. We have learned that very little, if any, of the results of so-called "training" is carried over from one realm to another—and especially from the theoretical to the practical, unless there be conscious purpose to do so on the part of the individual. We want to secure the habit of using the scientific method everywhere—and a sense of dissatisfaction if this is not possible. In the present terminology we need to motivate the use of the scientific method.

In order to secure something more of this personal acceptance of the method for daily use in life, I asked each member of the class to select for study some practical relation or conclusion or decision in life to which this method we had just been studying could be applied. The following topics were offered by a class of 25 students:

1. A young man choosing a wife.
2. Young woman choosing her course in college.
3. Selection of a college.

4. Selection of friends and associates.
5. Selecting a plan for a house.
6. Forming an estimate of people.
7. Selection of a teacher by a school board.
8. To determine the best uses to which the various parts of a tract of land shall be put.
9. The selection of books.
10. Choice of a location for a residence.
11. In selection of right "steps" in life (conduct).
12. Selection of a horse for farm purposes.
13. Selection of a vocation in life.

These were announced in class; a brief discussion of them as subjects suitable for the application of the scientific method, was had; and each subject was reassigned to the one who had proposed it for development. The student was asked to determine to what extent and how these steps from observation to conclusions could be employed in the particular determination, and actually to go through these steps in an illustrative way, as analogous to life as possible. For example, several proposed the "Selection of a College." These were asked to get together all the facts possible respecting a number of colleges, in ways which must, in the absence of a visit to the college, take the place of their own observations; similarly note any other classes of facts that would enter into the final choice,—as, their own capabilities, tendencies, purposes, and preparation. In this way, by enumerating these qualities of the various colleges, by comparing, classifying and discriminating among the the qualities, they are enabled to compare the colleges point by point and classify them into certain groups, based on certain qualities that have seemed to the student, worth while.

By processes such as this it is quite possible to make young pupils realize that wrong conclusions and decisions are dependent chiefly on: (1) incomplete or incorrect data; (2) on poor discrimination; and (3) on the effect of prejudice on our willingness to give proper weight, in the reasoning process, to *all* the facts.

A number of these analyses were reported and criticized in class.

In a similar way I have asked the individuals of classes to undertake to consider, in a scientific manner, some particular conclusion which they had reached during the day or week.

## Suggested Syllabus of High School Zoölogy.

### A. INTRODUCTION.

In making this second step toward the formulation of a syllabus for the teaching of biology in the high schools of Illinois, your committee desires to refer you to the following statement made in the introduction to our report last year:

"A course in high school biology should seek the following, among the possible things:

- "1. The production and conservation of a vital interest in plants and animals.
- "2. An appreciation of the human values of plants and animals.
- "3. The encouragement of the attitude of raising and solving problems concerning plants and animals.
- "4. Some ability to use the library, the field, and the laboratory in individual pursuit of these interests.
- "5. The ability to sustain interest in these problems through considerable periods.
- "6. A sense of the way in which organisms respond to the environing conditions.
- "7. An elementary conception of development and of the evolutionary series of animals and plants.
- "8. Some knowledge of living material; its organization in plants and animals; its properties and the relation of these to the activities of the organism.
- "9. Some experience in classification of organisms—*theoretical and practical*.
- "10. A conception of the place of man in the biological series, along with the

conviction that this does not invalidate, but rather heightens, the meaning of all the higher human qualities.

"11. A sane, wholesome appreciation of the origin and meaning of sex, and of its bearing on human life.

"The committee believes that it is not desirable, even if possible, to have uniform courses in biology in the different schools of the state. We believe, however, that all exercises in all schools should be handled in such a way as to secure the 'scientific habit,' which includes among other things—the habit of correct observation; of accurate expression of these observations both by means of notes and drawings; of discriminating between superficial and essential observations; of correct thinking; and of willingness to retest the final conclusions when new evidence appears."

In the report of last year we undertook merely to indicate some general types of exercises which, in our opinion, were essential to an elementary course in zoology and in botany. In accordance with our instructions to proceed further with this work, it becomes necessary for us to indicate more exactly the special exercises, under these general types which were approved by you, which might be expected to accomplish the aims upon which we are agreed. This report offers tentatively such a list of topics for the subject of zoology.

The committee realizes that this is an unsatisfactory stage in which to report our progress—in that it goes beyond the sure ground of the very general statements in the first report, and yet does not give sufficient detail to justify itself as a manual. Without elaborate description, impossible in the limits of such a report, many of these exercises may appear to teachers as indefinite and equivocal. Effort has been made, however, to add such suggestions as will enable the teacher at least to see workable territory in each of the exercises.

If the conference wishes to go any further in this matter, the next step is the preparation, or the selection, of a practical manual of zoology in which each of the topics is elaborated in a suggestive way, with citations to some of the zoologies in current use in high schools, in connection with which this detailed syllabus might be used. It is hoped that this may be accomplished by the time of the next meeting, in case you decide to take this further step. One such exercise (Exercise No. 1) is given in detail, to illustrate what is possible.

Concerning the list of exercises, offered in the present report, the committee wishes to make the following remarks:

1. It is thoroughly well understood that all the exercises listed here cannot be handled in a scholarly way in one term, or even in two terms. It is equally true that some teachers and some schools will be better fitted to emphasize some of the exercises, and others for equally good reasons will prefer to use others. It is not the purpose to secure perfectly uniform iron-clad courses of zoology in our schools.

2. Teachers should feel free, therefore, to bend such a list of subjects to their needs. It is suggestive rather than final. It is intended to give a standard which shall include the *chief things for which a secondary course in zoology should stand*, and a suggestion of some of the kinds of exercises that may be used to meet these ends.

3. In case a whole year is given to zoology, with approximately five periods weekly, some of which ought to be double periods, something like one day could be given, on the average, to each of these proposed exercises. But even under these circumstances it will be found that the exercises are not of equal interest, importance, or difficulty; some may be very much abbreviated, or even omitted, and others will require much more than a double period to work out even in a superficial way. Some of the exercises may readily be elaborated so as to give profitable work for several days. In other instances two or more exercises may be concluded at one period. No teacher must allow any text-book or syllabus to determine the rate of passage through the subject; the interest and interests of the pupils, his own conception of the objects to be reached in the particular course, the degree to which the exercise is accomplishing the proposed objects, and such considerations must control his progress and his emphasis.

4. In schools where only one-half year of five periods a week is given to zoology, the teacher and class should select such exercises as seem to them most worth

while—provided *some* exercises from *each* of the general realms are selected. The pupil should be induced to work and think in each of these main fields in order to have the subject fairly opened up to him. The amount of emphasis upon each field can well be left to be determined year by year in various schools in accordance with the principles suggested above.

5. The following exercises lend themselves to expansion: 8, 9, 19-29, 34-55, and almost any of those in Series X-XIV. The following are readily subject to abbreviation and combination: 10-13, 58-72, 93-105. Certain groups of exercises may be shortened, and yet retain a large part of their suggestiveness by assigning different exercises to different pupils for careful investigation; the results of these studies to be reported to the class, and there discussed. This is peculiarly true of Series VIII, XI, XIV—and, if necessary, XII and XIII.

6. In respect to order, it will be apparent to the teacher that some of these groups of exercises, if they are to be used at all, naturally belong where they are placed; others may readily be shifted into adjustment with the text-book in use, or with other conditions confronting the teacher.

Series I and II should naturally come very early; the calendar study for each pupil should be selected as soon as the pupil gets sufficient glimpse of the field to enable him to put some personality into the selection; the study of the representative animal should come while the animals chosen are plentiful and active; the Economic Studies (Series VIII) should come whenever the conditions are best for the study of each of them, since their arrangement is in no sense chronological; the same is true of Series XI—the development of animals. Most of the other series can be shifted to meet the local needs. The studies in Series XIV might very appropriately be assigned, one by one, at opportune points, through the course, for the purpose of enlivening interest and thus of motivating the course.

Finally, your committee in the light of its conviction that rigidly uniform courses are unwise, and in recognition of the diversity of views among equally good teachers, would suggest, without any definite recommendation, the following as the possible future, constructive tasks of this section in the interest of the teaching of high school biology in Illinois:

1. The selection, or the formation, of a practical manual of zoology on the basis of the present report.

2. The preparation or selection of a practical syllabus and manual of botany in the same general spirit.

3. The preparation of a practical manual of biology, in which botany, zoology, and human physiology are really unified and not merely welded.

## B. A SUGGESTED OUTLINE OF EXERCISES FOR PRACTICAL WORK IN ZOOLOGY.

### I. *Introductory. Exercises for Appreciation.* (Exercises 1-4.)

*Purpose:* To secure, early in the course and in an informal way, such a view of the subject-matter of biology and its relations to life that the student may have a real appreciation that will beget responsiveness.

Ex. 1. The Attractiveness of Nature. An informal study from memory, and a discussion, of the elements that tend to make nature beautiful and attractive to man.

#### *Exercise 1, illustrated in detail.*

*Method:* An exercise like this, may properly take the form first, of a conference of the class indoors, followed by an informal excursion to the nearest particularly attractive point of natural interest. Stereopticon, or other pictures, may be used very profitably to supplement, or even replace the excursion if the latter is not possible. The spontaneous expression of the pupil should be encouraged. The "Scientific Method" may properly be held in abeyance in these first exercises.

#### *Topics:*

1. *The Student's Memory of His Most Beautiful Natural View.* What kinds of things helped make it beautiful? What part did the form of land play in it? What part, water? What, clouds and "atmosphere"? What part did living objects, plant, or animal add? Why do you think such things seem beautiful to humans? Do you think this quality of appreciation in us can be cultivated and

strengthened? Do you think it would, on the whole, add to the pleasure and value of life to strengthen it? Is it quite wise on our part to wait until we find all these elements of beauty in *one place* and in *extreme degree*, before we allow ourselves the pleasure and inspiration that come from appreciating them? What is the first quality we should try to cultivate in ourselves in order to get this pleasure? What next?

## 2. *The Special Contribution of Living Objects to Nature's Attractiveness.*

As you think of the beauty of the earth, what is added to it by plants? In what ways do animals add to it? Mention what seem to you now the chief beauties and interest of plants; of animals. Supplement with appreciative literature, and with pictures in which plants and animals are attractively represented.

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Ex. 2. The Attractive Natural Points, Locally. A visit, a report, and a discussion of the most beautiful natural conditions in reach of the class, which may make a concrete test of the general conclusions in Exercise 1 concerning the beauties of nature.

Ex. 3. The Pupils' Present Knowledge of Plants. A summing up of the knowledge of the class respecting plants, their characteristics, their value to animals and to men, their place in human industry and business.

Ex. 4. The Pupils' Present Knowledge of Animals. A similar inventory of their appreciation of animal values and relations.

## II. *Introducing to the Library and the Field.* (Exercises 5-9.)

*Purpose:* To acquaint the student with the books he will use, to teach him how to use them, to enable him to go willingly and with intelligence to the "field" in search for real problems and real solutions.

Ex. 5. A Library Exercise. Examination of available books, the making of a selected, classified list of a limited number, together with some broad estimate of the characteristics of at least a few of them. Discussion in class.

Ex. 6. A Preliminary Survey of the Territory. Examination by each student of a selected territory, with notes, and a map showing its general character. Reports. A list of questions suggested to the student by the study.

Ex. 7. A Special Survey of a Limited Territory. A general study, and report on the study, of *all* the observed animal life of a small area selected by the student. A list of the pupil's questions arising out of the study.

Ex. 8. A Collecting Excursion. The collecting and keeping in good condition of all animals captured on a special excursion; with notes about all animals found. List of questions for further study.

Ex. 9. Rough Identification of Animals Collected. Use of pictures, descriptions, and simplest possible keys, etc., to locate in a general way, the animals collected. This exercise may be extended, with profit, over several periods.

## III. *Introducing to the Laboratory and Microscope.* (Exercises 10-13.)

*Purpose:* To acquaint the student with the general nature of work in the laboratory; to introduce him to the most remarkable instrument which we have to aid us in such studies; to enable him to get a mastery of the elementary use of the low power of the microscope. This series should be reduced to one or two exercises unless each student, or pair of students, has access to an instrument.

Ex. 10. The Construction of the Microscope. To get the main facts about the microscope, to suggest the uses of the parts, to show how structure and function are related.

Ex. 11. Securing Illumination. Theoretical and practical.

Ex. 12. Securing Focus. Theoretical and practical.

Ex. 13. Discovering the Effects of the Microscope on the Appearance of Objects.

#### IV. *Calendar Studies.*

*Purpose:* To bring the student into contact with some aspect of animal life in its successive relations through the year and thus encourage a sustained interest in some worth-while topic; to introduce the student to the seasonal rhythm of life and its meaning.

*Method:* These topics, preferably a different one for each pupil, should be selected early in the season, and should represent if possible some real interest of the student. There should be:

- (1) A clear statement of the topic of study.
- (2) An outline of the various methods of observation used.
- (3) A statement of the results of the observations.
- (4) Interesting or important conclusions based on the observations.
- (5) A report of any studies by other people on the same subject, as contained in the literature, and a comparison of such with the pupil's results.

#### *Suggested Topics:*

1. Any exercises on the life history of animals. (See Exercises 95-107.)
2. Some of the economic studies. (Exercises 34-54.)
3. Record of the behavior of any common species of wild animals through the varying conditions of the year.
4. The effect of the seasons on any of the great vital functions of animals—as reproduction, general activity, securing food, etc.
5. Actual observable animal inhabitants of a given area of favorable territory throughout the year. (Statistical and descriptive.)
6. An account of the changes of the bird or other wild life of the community during the year.
7. Certain questions of variation, heredity, natural selection, etc. (See also Exercises 119-142.)
8. In general, any topic which suggests changes in the animal life day by day owing to climatic or other environmental conditions.

Ex. 14. Selection of Calendar Studies. A careful discussion, and selection by each student, of some calendar topic. The elements to be considered in such selection. Discussion of the general method of attack.

#### V. *The Laboratory Method, and an Inductive Study of the Chief Differences between Inorganisms and Organisms, Plants and Animals.* (Exercises 15-18.)

*Purpose:* To use a few familiar objects to introduce the pupil to the scientific method and to get before him, free from new and puzzling knowledge, the steps that must be followed in order to reach right conclusions; to give him practice in taking these steps; and to enable him to get for himself a definition of inorganic and organic, plant and animal.

Ex. 15. Sand. Pebbles. Crystals. Observe, record, and compare the really observable characteristics of these.

Ex. 16. Shells. Characteristics. Distinctive features; compare with sand, pebbles, and crystals.

Ex. 17. Plants. Study as above. Limit record to student's actual observations.

Ex. 18. Animals. Study as above. General conclusions. What are, after all, the observable distinctions between these five classes of objects?

#### VI. *The Study of a Representative Animal.* (Exercises 19-29.)

*Purpose:* The purpose of this series of exercises is to guide the student in forming the habit and ideal of accurate observation and in making a clear and exact record of observations; to cause him to study with some care and in some detail the relations of one type of animal to its natural environment; to allow him to discover

the work which it is capable of doing, and its chief adjustments to its manner of living, and to appreciate the complexity of the organization of the animal whereby it is enabled to do the work necessary for satisfactory living. (It is assumed in the following exercises that the grasshopper will be the most generally suitable animal.)

Ex. 19. Representative Animal: Introductory. A discussion of all the important things that enter into the determination of what will be a suitable animal. Select in the light of this discussion.

Ex. 20. Haunts and Habits of Life. A general study, in the field, of the place of living, general and special; kind of food used; relation to one another, and the like. Follow by reports and discussions in class.

Ex. 21. Its Chief Activities. A study of its powers—just what it can do; as motions, locomotion of various types, etc. A close study and analysis of the differences between these modes of action; and of the purposes of them.

Ex. 22. The External Organs and Their Relation to the Kinds of Activity. A tabular display of the relation between the structures and their functions.

Ex. 23. Sensitiveness. An observational and experimental study of the evidences of sensitiveness, the special kinds of sensitiveness, the location of the sense organs, the nature of the responses, etc.

Ex. 24. Sensitiveness (continued). Tabular display of senses, organs, stimuli, etc.

Ex. 25. The General Plan. The symmetry of the animal. What elements enter into symmetry?

Ex. 26. The General Plan (continued). Comparison of the axes. The meaning of dorsal and ventral, anterior and posterior, right and left; and the location of the various organs in relation to these regions, and the reasons therefor.

Ex. 27. General Plan: The Regions of the Body. A study of the form and function and relations of the three regions; head, thorax and abdomen.

Ex. 28. Special Organs of the Three Chief Regions. A tabular display of all the organs related to each of the regions; their form, position, and functions, with drawings of them.

Ex. 29. Review of Representative Animal. Questions to unify the results of the study, and to apply the proper descriptive names to the organs.

## VII. *Comparative Work in the Phylum to which the Representative Animal Belongs. (Arthropoda.)* (Exercises 30–33.)

*Purpose:* To cause the student to compare other slightly known animals with the grasshopper, and thus further emphasize his picture of the latter; to enable him to realize that his knowledge of animals in general is not exact; to give him a better conception of the group of insects and of its principal orders.

Ex. 30. *Off-Hand Comparison of Some Familiar Animals with the Grasshopper.* Enumerate from memory the main points of likeness and unlikeness between ten or fifteen known animals and the representative animal.

Ex. 31. Identification of Insects. Each student should identify a few of the common insects by means of keys, figures, knowledge of their common names, etc. Location of a few less known forms in their proper Orders.

Ex. 32. Comparison of Insects. A tabular comparison of a representative insect from several of the Orders as to habitat, mouth parts, wings, form of body, metamorphosis, larval habits, etc. (Field and library.) Definition of chief insect Orders.

Ex. 33. Comparison of Orthoptera (Tabular). A table bringing together, with some exactness and from any source of information open to the student, the points of likenesses and unlikenesses of grasshopper and other orthoptera—as the cricket, katydid, cockroach, walking-stick, etc.

Comparison of Orthoptera (Illustrative Table.)

| Characteristics                   | Cricket     | Katydid | Cockroach | Pupil's Selection | Grasshopper |
|-----------------------------------|-------------|---------|-----------|-------------------|-------------|
| Habitat and habits                |             |         |           |                   |             |
| Coloration and protective devices |             |         |           |                   |             |
| Body                              | Shape       |         |           |                   |             |
|                                   | Regions     |         |           |                   |             |
|                                   | Proportions |         |           |                   |             |
|                                   | Segments    |         |           |                   |             |
| Thoracic Appendages               | Legs        |         |           |                   |             |
|                                   | Wings       |         |           |                   |             |
| Kinds of locomotion               |             |         |           |                   |             |
| Mouth-parts                       |             |         |           |                   |             |
| Antennae                          |             |         |           |                   |             |
| Eyes                              |             |         |           |                   |             |
| Economic Importance               |             |         |           |                   |             |

In what respects do all these animals agree?

#### VIII. *Economic Studies.* (Exercises 34-55.)

*Purpose:* To make a practical application of zoological studies to human welfare and thus to strengthen the hold of zoology on the pupil through its human interest; to give knowledge that may be of direct practical utility; to reveal to the student the sources of our information of economic zoology, and to acquaint him with the work of our state and national bureaus and laboratories.

*Method:* All of these studies call for (1) actual observations by the pupil in the field; (2) inquiries of local experts—as farmers, stockmen, gardeners, orchardists, etc.; and (3) references to the libraries. In each case the general facts of advantage or disadvantage, the facts relating to the care of, or protection against, and the zoological place, should be brought out in such a way as to bind together the scientific and the practical aspects of the problem. Unless there is abundance of time, only those studies should be undertaken in which the student can reasonably hope

to get, promptly, enough facts to reward his search. Further emphasis may be given to this matter by co-ordinating it with the study of the groups through the year. Some teachers prefer to do the economic work in the latter way solely.

Ex. 34. Economic Studies: Introduction. Finding out and utilizing all the student's present knowledge of economic values of animals. Enumeration and systematic classification of these values.

Ex. 35. Domesticated Animals. The main facts.

Ex. 36. Comparison of Domesticated Animals. (Tabular.)

Ex. 37. Pests of House and Barn. The main facts.

Ex. 38. Comparison of Household Pests. (Tabular.)

Ex. 39. Animals Producing Disease. The main facts.

Ex. 40. Comparison of Disease-Producing Animals. (Tabular.)

Ex. 41. Animals of the Garden. Main Facts. (Suitable for calendar study.)

Ex. 42. Comparison of Animals of the Garden. (Tabular.)

Ex. 43. Animals of the Orchard. Main facts. (Suitable for calendar study.)

Ex. 44. Comparison of Animals of the Orchard. (Tabular.)

Ex. 45. Animals in Relation to Field Crops. (Suitable for calendar study.)

Ex. 46. Comparison of Animals Affecting Field Crops. (Tabular.)

Ex. 47. Pests of Stored Seeds, Fruits, and Grains. Main facts.

Ex. 48. Pests of Shade and Forest Trees. (Suitable for calendar study.)

Ex. 49. Comparison of Animals Destructive of Trees. (Tabular.)

Ex. 50. The Food-Yielding Animals. Main facts.

Ex. 51. The Animals Yielding Clothing to Man. Main facts.

Ex. 52. Comparison of Animals Furnishing Clothing. (Tabular.)

Ex. 53. Pets. A general study of the problem; the special types that have been so used; a detailed study by each student of some pet species, and its history.

Ex. 54. Animal Industries. A study of the organized human industries based on animal life. Some of the facts, with the zoological foundations for them.

Ex. 55. Comparison of Animal Industries (Tabular), as to human importance, geographical distribution, etc.

#### IX. *Studies of the Essentials of Living Matter.* (Exercises 56-57.)

*Purpose:* To enable the student better to get a notion of the machinery on which life depends, and of the real size, shapes, appearance, and powers of the cells, which are conveniently thought of as units of living matter.

*Method:* Demonstrations and studies of stained and unstained cells under the compound microscope, together with a study and comparison of all the figures of cells and tissues that can be found.

Ex. 56. Study of Single Cells. Microscopic study of cells, whole and in sections, showing characteristic parts. Dividing cells.

Ex. 57. Study of Cells in Union. Tissues. Demonstration and discussion of some representative tissues.

#### X. *Study of Types Illustrating the Evolutionary Series.* (Exercises 58-94.)

*Purpose:* To give the student a systematic view of the animal kingdom which can be had in no other way than through a progressive study of some representatives of the more important phyla; to enable him to realize the relation of increasing complexity of structure to increased efficiency of functioning, as one passes from the lower to the higher; to heighten his sense of the unity of animal life; to enable him to expand the type of the phylum by comparing other members of the phylum with it.

*Method:* In all the studies of this series it will be understood that physiology, morphology and ecology will be mingled. It is not the purpose to give mastery of many details of structure, but rather to enable the student to realize the animal as a living machine with certain necessary adjustments to make and certain structure to make them with. There is no purpose of making a sharp analysis of the work, into morphology, ecology, and physiology.

Ex. 58. Introductory Examination of Cultures for Protozoa.

Ex. 59. Paramecium. Activities and form.

- Ex. 60. Comparison of Various Protozoa. (Tabular: laboratory and library.)
- Ex. 61. Sponges.
- Ex. 62. The Simple Metazoa : Hydra.
- Ex. 63. Hydra (continued).
- Ex. 64. Coelenterata Compared. (Tabular.)
- Ex. 65. The Simple Metazoa: Flatworms.
- Ex. 66. Comparison of Parasitic Worms. (Tabular: library.)
- Ex. 67. The Starfish.
- Ex. 68. Comparison of Echinoderms. (Tabular.)
- Ex. 69. The Earthworm: Habits and Powers; Economic Values.
- Ex. 70. The Earthworm: Form and External Structure.
- Ex. 71. The Earthworm: Internal Functions and Organs.
- Ex. 72. Comparison of Segmented Worms. (Tabular.)
- Ex. 73. A Clam (or Snail).
- Ex. 74. Comparison of Mollusks. (Tabular.)
- Ex. 75. A Fish: Habits and General Form.
- Ex. 76. Fish: Activities and Powers; Special External Structures.
- Ex. 77. Comparison of Fishes. (Tabular.)
- Ex. 78. The Frog: Habitat and Habits; Activities in Laboratory.
- Ex. 79. The Frog: General Form, Structure, and Development.
- Ex. 80. The Frog: Skin, muscles, visceral organs—structure and functions.
- Ex. 81. Comparison of Amphibia. (Tabular.)
- Ex. 82. Reptiles: Study of General Characteristics. Field and library work.
- Ex. 83. Comparison of Reptiles. (Tabular.)
- Ex. 84. Birds: Varieties, Habitats, Noteworthy Habits.
- Ex. 85. Birds: Other Activities and Powers.
- Ex. 86. Birds: General External Form and Structure.
- Ex. 87. Comparison of Birds. (Tabular.)
- Ex. 88. Mammals: Introduction. General characteristics; varieties.
- Ex. 89. Mammals: Field and Laboratory Work. Habits, powers, distinctive structure.
- Ex. 90. Man as a Mammal. General Animal Habits and Activities.
- Ex. 91. Man as a Mammal. Form of body; structure of internal organs.
- Ex. 92. Comparison of Mammals. (Tabular.)
- Ex. 93. Comparison of Vertebrates. (Tabular.)
- Ex. 94. Comparison of Animals. (Tabular.)

## XI. *Studies in the Life History of Animals.* (Exercises 95-107.)

*Purpose.* To enable the student to realize the simple way in which organisms start life and the steps whereby they reach maturity; to make clear the meaning of the life-cycle; to enable him to realize something of the meaning of reproduction and development among human beings.

*Method:* The time available will not allow each pupil to study even casually all the exercises in this section. It is suggested rather that all shall study Exercises 95-97, and that others chosen shall be divided among the students. Reports of all those individual studies should be made to the class, and all members should make the tabular comparison. These subjects are also suited to be calendar studies.

- Ex. 95. Reproduction in Lower Forms: Protozoa, Hydra, etc.
- Ex. 96. Reproduction in Higher Forms: Frog, Bird, etc.
- Ex. 97. Reproduction in Mammals, including Man.
- Ex. 98. Life History of Animals: Sea Urchin (Early Stages).
- Ex. 99. Life History of Snail. Eggs, fertilization, development.
- Ex. 100. Life History of Mosquito. Egg laying, fertilization, metamorphosis, etc.
- Ex. 101. Life History of Blow Fly.
- Ex. 102. Life History of Butterfly (or Moth).
- Ex. 103. Life History of Potato Beetle.
- Ex. 104. Life History of Spiders.
- Ex. 105. Life History of Frogs or Toads.

- Ex. 106. Early Life History of the Chick.  
 Ex. 107. Comparison of Life Histories. (Tabular.)

## XII. *Studies in the Life Relations of Animals.* (Exercises 108-118.)

*Purpose:* To enable the student to see at first-hand, how living objects are adjusted to some of the chief features of their environment; to discover what the really vital relations are; and to give him a better practical foundation for understanding what is found in the books on the subject.

*Method:* The student should combine the field, laboratory, and the library in these studies. A series of representative animals should be chosen, and their relation to the various environmental factors observed and recorded. Portions of this work may be done in connection with the study of the typical animals suggested in Section X.

Ex. 108. Introductory. An enumeration and classification of the influential conditions of life with which the students are already somewhat familiar; fundamental and secondary conditions.

Ex. 109. Food and the Food-Relation. Organs for food capture; senses involved therein; choice of food; storing of food, etc.

Ex. 110. Relations to Moisture and Drouth. Adaptations to life in water, in moist places, in drouth, etc.; and to the use and retention of moisture internally.

Ex. 111. Relation to Temperature. Sense of temperature; bodily heat; special adaptions to changing temperature.

Ex. 112. Relation to Light. Sensitiveness to light; light and darkness lovers; perception and influence of color; seeing objects; eyes.

Ex. 113. Relation to Gravity and to the Density of the Medium. Gravity in relation to the normal position of animals; form of the body in relation to gravity; specific gravity in animals in relation to the medium in which they move. Effects of these things on animal organization.

Ex. 114. Relation to Sound. Nature of sound and the process of hearing in various grades of animals. Points of uniformity and of difference in the sound-receiving organs.

Ex. 115. Relation to Offspring. Various ways and degrees of care of offspring. The meaning of it in evolution.

Ex. 116. Relation to other Members of Same Species. Relations of mates; voluntary association, etc.

Ex. 117. Relations of Animals of Different Species: helpful, hurtful, and indifferent.

Ex. 118. Relations to Plants. Plant-eating animals; plant homes for animals, insects, and flowers, etc.

## XIII. *Studies Relating to Variation, and Evolution.* (Exercises 119-129.)

*Purpose:* To introduce the student systematically to one of the most interesting of the modern aspects of the subject, and to give him a foundation in his own observations by means of which he may the better appreciate the literature dealing with it.

*Method:* Direct observations, supplemented by reference work.

Ex. 119. Study of Variations in Man. Kinds and amounts of variations found among humans; that found in one family, etc.

Ex. 120. Variations in Poultry. Quality and quantity of variations within a breed; among breeds, sources of variations.

Ex. 121. Comparison of Varieties of Domestic Fowl. (Tabular.)

Ex. 122. Variation in Wild Species.

Ex. 123. Inheritance in Man. A study of the kinds of things that are inherited.

Ex. 124. Inheritance in Domestic Animals. Observed facts of.

Ex. 125. Inheritance in Wild Species. Comparison of inherited and acquired qualities.

Ex. 126. Rate of Multiplication in Animals. Possible increase; actual increase.

Ex. 127. Rate of Multiplication. Inorganic forces that keep down population; organic enemies; cite own observations.

Ex. 128. Adaptation. Effects of cross-breeding and human selection of animals; effects of natural forces on animals in the long run.

Ex. 129. Adaptation among Humans. Through inheritance (eugenics); through environment (euthenics).

#### XIV. *Studies of certain interesting and extraordinary adaptations among animals.* (Exercises 130-142.)

*Purpose:* To introduce the student in a systematic way to some of the more striking and spectacular facts of animal life; to add to the general interest and appreciation of the child in the animal kingdom; to suggest subjects for popular interest and reading after the course is finished.

*Method:* A large part of this work will necessarily be library work, and yet in each exercise the student should be urged to record the main facts of his own knowledge and observation first. A few of them lend themselves to experiment and measurement. It is probable that an increase of general interest could be secured in most classes by assigning these subjects at intervals during the course rather than by reserving them all for the end of it.

Ex. 130. Beauty among Animals. Examples of; the elements that contribute to beauty in different species.

Ex. 131. Size of Animals. Range of size within a species; among different species. Facts concerning peculiarly large and peculiarly small types.

Ex. 132. Strength in Animals. Methods of testing. Record of some results of testing and of reading.

Ex. 133. Rate of Motion. Measurements; records; interpretation in respect to general habits and conditions of life.

Ex. 134. Weapons of Animals. Study of the kinds, position, degree of development, manner and purpose of using, etc.

Ex. 135. Migrations. Local studies and references; times of year, direction, causes of, manner of, etc.

Ex. 136. Mating Habits of Animals. Differences between males and females, in structure and disposition, and the reasons therefor; courtship; types of mating.

Ex. 137. Home-Making among Animals. Types and purposes of homes; careful study of some particular types.

Ex. 138. Industries of Animals. Animals that play or work spontaneously; nature and value of these activities.

Ex. 139. Co-operation among Animals. Observed and recorded instances of animals of the same species working together in a co-operative way to accomplish results; of different species.

Ex. 140. Community Life. The degree of closeness of the social life of the members of some familiar species of animals; of foreign species of animals.

Ex. 141. Parasitism. The facts in the life history of at least one or two parasites. The general conditions and results of parasitism. A table of parasites, their hosts, diseases they produce, and the phylum to which the parasite belongs.

Ex. 142. States of Activity and Rest. Relation of activity and rest in man and other known animals. Fatigue, rest, sleep, restoration; their physiology.

#### CLASSICS SECTION.

The Section was called to order by the chairman, Professor Barton, who after some general remarks and announcements introduced the first speaker, Superintendent C. F. Ford, of Edwardsville, Ill., who discussed the topic, "Factors that Make the Second Year of Latin Study

a Critical One." The speaker thought that the time required in preparation for the Latin of the second year was out of proportion to that required in other subjects; that the year now given to the preparatory text is too little; that a return to the grammar and reader method would be desirable. Other factors of a more general nature were mentioned.

The following is an abstract of Mr. Ford's paper:

The high mortality among Latin pupils of the second year is an accepted fact. Some depletion of the Latin classes is to be expected in the first year on account of incompetency and distaste for the subject; after this elimination of the unfit, however, the best of results ought to be expected in the second year's work.

On the contrary the loss in the second year is about the same proportionally as in the first year—about fifty per cent according to statistics.

The results of such desertions from the Latin classes are disastrous. There seems to be no good reason why the normal child cannot learn Latin, hence the cause of the condition must lie beyond the pupil's control.

The purpose of the paper is to inquire into causes rather than to suggest remedies; the liberty will be taken, however, to discuss briefly ways and means of bettering results.

A general inquiry of a considerable number of pupils who have dropped their Latin work, as to causes for so doing, would be desirable. The shortness of the time permitted the questioning of only a small number of pupils, all from the same school. The narrow scope of the inquiry prevented any valuable conclusions, but a few pertinent facts were even thus developed.

A large majority of the pupils questioned seemed to have dropped Latin, not from lack of interest, but because the preparation of its lessons required too large a proportion of their time. This complaint is substantiated also by the testimony of the teachers of other high school subjects. Even the best pupils must spend on their Caesar much more time than on other subjects with a consequent neglect of their other work. If a student were to devote to all his subjects the same time that he does to his Latin, we could justly be charged with over-working him.

This question of time involved appears to be one of the important factors in making the second year a critical one. While Latin is unquestionably more difficult than many of the other high school subjects, yet it ought not to require too large a proportion of a pupil's time. A change in the course or requirements that would better this condition

would, in the opinion of the writer, appreciably decrease the mortality of the second year.

As to the change in the Latin course; one year's time, spent on Beginning Latin, appears to be too short to prepare the pupil for Cæsar. The suggestion is made to devote instead one and a half to one and a third years to preparatory Latin, and to reduce the requirement in Cæsar to three—or better, two—books, or its equivalent. There would be no real loss, as it would undoubtedly be preferable to do a smaller amount of reading well than a large amount poorly. This suggestion applies particularly to the high school, as in some preparatory schools of other types quite different conditions prevail.

The type of beginner's book: The grammar and reader method of a generation ago seems to the writer to be more logical and productive of better results than the type of beginner's book in common use now. As described by Professor Bennett the older method was as follows: ". . . . The pupils were taught the five declensions in succession, then the adjective, pronoun, and the four conjugations. During the acquisition of forms little attention was paid to syntax . . . . Like the study of forms, the study of syntax followed the order of the Grammar, i.e., all the constructions of one case were treated together, etc." In the accepted beginner's book of today the method used in both forms and syntax is a sort of "spiral," which does not seem to succeed in fixing either clearly in the pupil's minds. As Professor Bennett says again, the pupils of today "are conspicuously inferior in their mastery of the inflections (and principles of syntax) to the pupils of twenty years ago." The "spiral" method appears to be a failure in Latin instruction just as it has proved to be in the work of the elementary school.

Methods of teaching: The cause for the condition in the second year does not appear to lie chiefly with the teachers. Our teachers of Latin are as a whole well prepared, and the falling off in the second year is so general as to indicate that faulty teaching is not the main cause. The two most obvious and general faults perhaps,—especially in the young teacher,—that might be mentioned, are, first, the failure to recognize the limitations of boys and girls of high school age; and, second, the proneness to be vague and indefinite in the assignments of the lessons of the second and succeeding years.

Besides the factors affecting the work of the second year, which are intrinsically a part of the Latin course itself,—discussed above,—there are extraneous elements having a distinct bearing on the subject.

The well known disinclination of young people toward hard work, coupled with the indulgence showed to boys and girls of this generation, has tended to encourage them in dropping subjects that are difficult, whenever possible, in favor of fancied "snap" courses. Modern methods in education have also fostered this attitude to some extent. "To the worship of the idol of Play," says Charles Miles Gayley, we especially attribute the lapses of mental and moral discipline, unfortunately common among our young people of today."

Again, the expansion of the modern high-school course of study and the prevalence of the elective system, have produced distractions that did not formerly exist. The constant call of the public for "something practical," and the failure to recognize anything as practical that is not immediately convertible into dollars and cents, has produced a feeling of discontent and impatience with anything whose utility is as remote as is that of Latin. Not the least of the factors that make the second year, or any of the years of Latin, critical ones, is the unfair and unreasoning criticism proceeding from the ultra-commercial spirit of our times.

The topic was further discussed by Mrs. Laura Frazeur of the Lake View High School. The teacher was held to be the chief factor, that he must realize that the work is worth while; that the great difficulty met with in the second year is the handling of the long sentence and that effort must be centered around this; and that thoroughness must be insisted on rather than quantity. The topic was further discussed by Principal George B. Swain of Lockport, Principal E. S. Lake of Benton, Mr. Gallagher, Miss Durland, Miss Ponzer and Miss Sabin.

Following is a synopsis of Mrs. Frazeur's discussion:

1. Loss caused by discouragement on account of inherent difficulties and lack of time.
2. Inadequacy of beginner's book.
3. Inadequacy in some cases of second year teacher.
4. The age in which we live.
  - a. New pedagogical processes.
  - b. Elective courses.
  - c. Multiplicity of interests.
  - d. Disinclination on part of pupil to work.
1. Conditions prevailing in Chicago.
  - a. Growth of schools.
  - b. The strenuous life.

c. Need of so called practical studies.

d. Dissatisfaction with old things.

2. Teachers of Latin all believe or should believe in Latin because of, (a) training in essentials of scientific method; (b) making the English language intelligible; (c) developing power of expression; (d) bringing the mind in contact with literature in elemental forms; (e) giving a basic insight into civilization; (f) cultivating the constructive imagination; (g) clarifying moral ideals and stimulating to right conduct; (h) furnishing a means of recreation. (Quoted from Professor Kelsey.)
3. The teacher is the most important factor in making the study of Cæsar interesting, practical, suggestive and stimulating.
4. Admirable quality of the material in the Commentaries—viz.: (a) perfect Latinity; (b) interesting descriptions, thrilling acts of heroism, interesting primitive customs, religions, governments, geography; (c) exhibition of intellect, courage and generalship of one of the world's greatest men; and the best diet for "vigorous Latin constitutions."
5. Difficulties of finding a suitable first year book conceded. Question as to whether new arrangements of presenting verbs, nouns, syntax, etc., is as satisfactory as the old way of following the grammar and taking up parts of speech, syntax, etc., in a somewhat logical sequence. Teacher must be greater than the book—and by means of supplementary reviews round out and synthesize the material.  
During the first year special emphasis should be laid upon forms, meaning and essential elements of *verb*. Constant repetition and drill upon all verb forms necessary throughout the four years.
6. Greatest difficulty in Cæsar, the manipulation of the long sentence. A thorough mastery of its component parts necessary at first with careful parsing and diagraming. Progress should be slow at first but quantity of material should increase gradually, and the amount read in a year should depend upon the ability of the pupils. Only parts of all the books should be read with the narrative supplied in English by the teacher.

7. Definite assignment of lesson should be made. The pupil should know just what is expected of him and short competitive tests on verb forms, noun forms, and syntax should be frequently given. Pupils may assist in correcting papers. Time may be saved by assisting pupils in different advanced lessons often by reading more puzzling passages. Greatest emphasis should be laid on a review in good, clear, idiomatic English. Definite chapters should often be assigned to certain pupils.
8. The proposition of teaching forms and syntax of beginning Latin during the second year should continue only in a form based upon Cæsar or some easy text which may serve as a bridge for a month or so. *Fabulæ Faciles*, *Viri Romæ*, serve as satisfactory bridges, to be read at the end of the first year and beginning of the second for a short time. After that Cæsar is the best text because it is the best and simplest genuine Latin.
9. Reasons why pupils drop Latin at end of second year. According to their own statements, it is because of its difficulty, the time involved in preparation, and the idea that two years of Latin is enough if a modern language is substituted. Non-requirement of Latin, at least third and fourth year Latin by the colleges and technical schools plays a great part in shortening the Latin course.  
The pupils are bewildered by the great number of courses offered in the curricula of the large schools and their tendency often is to flit about among many lines of work and in many cases to follow the line of least resistance.  
Necessity of vocational courses. They have come to stay. Many pupils need them more than they need Latin. Decrease in numbers in classical course should be counterbalanced by an increase in quality of work. Responsibility rests upon the teacher of Latin if it is to maintain its place in high-school curricula. He should inspire in the pupils a sense of its value in practical life, its necessity to a person of ordinary education not so much by trite phrases as by practical and frequent tests of its value.  
Miss Paxson's article in the November number of the *Classical Journal* a suggestive one.

The various means: emphasis on English derivatives; exhibits like Miss Sabin's of the Oak Park High School; sets of classical slides; the Latin Club, paper, use of quotations and mottoes; discussion of interesting points found in the text and modern comparisons—such as methods of war, government, bridge building, socialism, geography, religion, etc; synopsis of different books—with supplementary English narrative so that pupils may get an understanding of the historical sequence and know what he has read.

The second topic of the program was, "What the Second Year of Latin Study Ought to Accomplish for the Pupil." The chief paper was then given by Miss Margaret A. Older of Robinson. The paramount aim should be to enable the pupil to read Caesar. Emphasis was placed on the need of definiteness in assignments, the need of translating ideas rather than words, work in English derivatives, the insistence on good English, and the fact that grammatical structure is now known only through Latin. Lastly the teacher should aim at power and logical reasoning obtained through knowledge of sentence structure.

An abstract of Miss Older's paper follows:

The paramount aim of second year work should be to enable the pupil to *read Cæsar* with all that that involves. The question is, how to accomplish the desired end, bringing out in the pupil the characteristics that give value to the study of Latin.

First, teach the pupil how to study. Go slowly at first, be very definite in assigning lessons, warn the class what constructions they will be expected to know, and during at least the first part of the year, read the advance at sight with the class, showing them how to use the phrase method. Aim to translate ideas, rather than words. Secondly, put more stress on the review lesson than on the advance, making that the real test of the pupil's knowledge, encourage definite questions, especially on the advance. Thirdly, do work on English derivatives, to help fix vocabulary in mind. Fourthly, insist upon *good* English, especially in review. Fifthly, try to bring out the construction or structure of the language; especially drilling upon connectives and relations between clauses. Diagraming is a help. Sixthly, drill systematically in prose composition, using simple sentences, and going over the points in advance with the class before letting them prepare the written work

In general, work for power; power of logical reasoning, of fine discrimination, of seeing relation of clauses and words, of using the English tongue, of accuracy and thoroughness.

This paper was discussed by Miss Harriet Bouldin of Springfield, who spoke in part as follows:

"Pupils at the end of the second year should be able to read Cæsar intelligently; to translate into idiomatic English. This comprises a definite knowledge of certain constructions, an understanding of word order; a knowledge of the historical background of the contents of Cæsar's Commentaries. Lastly, the ability to write Latin prose—not too difficult.

The requirement of four books of Cæsar is too much. We cannot do that amount thoroughly or well—four books is equivalent in amount to the six orations of Cicero. Latin should stand for thoroughness and exactness—for clear thinking. Better quality than quantity. The average high school freshman lacks concentration and a knowledge of English grammar. Latin will do much for him in the first year. He needs to take Cæsar for the training it will give him. The majority can do the Cæsar if they are not hurried and crowded. There is no difficulty about doing the required amount in third year in Latin.

Selections from the different books are advisable. By all means selected chapters from the siege of Alesia. The Ariovistus campaign with its load of indirect discourse should be omitted. Before finishing Cæsar pupils should have a definite knowledge of what was accomplished each year of Cæsar's stay in Gaul, that is, of each book of the Commentaries. This can be given them at different times by the teacher. Holmes' Cæsar in Gaul is invaluable for this.

The parts that certain tribes took, the parts taken by leading characters and their after history should be known. Books and articles helpful in giving this historical background are:

1. Holmes—Cæsar in Gaul.
2. Davis—A Friend of Cæsar.
3. Edwin Arnold—Phra the Phœnician (the first two chapters. Read these chapters in connection with the invasion of Britain.)
4. Modern Battlefields of Cæsar in Classical Journal, 1908; by Earle Parker.

Vocabulary. If possible connect the Latin word with the English derivatives. From *progredior* comes *progressive*, a name applied to the new party. *Republican* from *res publica*. In connection with this have

the pupils see that new words formed and coming into our language are largely of Latin derivation. Examples—*aviator*, *aeroplane*, etc. Latin cannot be called a dead language.

Prose. We should not attempt too much. Connected paragraphs desirable, and it is well to have five or six continuous days of prose. Master certain constructions.

Latin should be vitalized—and the practical side of it made to appeal to the pupil. This can be done by Latin clubs, etc.

Difficulties of translating. Hard for pupils to change from comparatively simple Latin of the first year to long involved sentences of Cæsar. We need to give them help and to be patient. Participles and the use of the ablative construction must be explained thoroughly. The difference in the Latin and the English sentence. In the first three months difficulties in advance lesson should be gone over in class. Work out the translation with them.

The meaning and use of certain words such as *res*, and *virtus*—*res*, a chameleon like word—that changes its meaning according to the company of words in which it finds itself.

Entertainments and by getting the opinions of prominent successful men, business and professional men."

The third topic of the morning was "A Proposed Experiment Looking to Increased Ability in Translating Latin." The chief paper was presented by Professor C. E. Allen of Carbondale. The speaker desired to increase greatly the student's ability to translate and proposed that the experiment be tried of having a class read a much larger amount during the second year with entire elimination of grammatical drill. There should be no geographical or other work required, such as is generally given, but the entire attention should be given to acquiring an ability to translate.

The following abstract is of interest to all Latin Teachers:

"The average second year pupil with our present methods does not acquire the power to translate Latin with any degree of fluency. Morphology, syntax and prose composition are not ends in themselves, or should not be, but are only helps in getting the meaning of Latin, and they are justifiable only to the extent that they help.

The proposed experiment is to take second year classes and have them *read* Latin, giving them no prose composition, no systematic work in the grammar, no collateral reading on the Roman army, history, or private life, but just the reading of a large amount of Latin—*Fabulæ Faciles*, *Viri Romæ*, *Eutropius*, *Nepos*, *Livy*, *Cæsar*,—any or all of

these and then see how they are fitted to read Cicero, and do the work usually required in the third year. The following course is suggested:

1. Ritchie's *Fabulæ Faciles* (complete).
2. *Viri Romæ* (lives of Pompey, Cæsar, Cicero and Augustus).
3. Nepos } At least as much in amount as the first 4 books  
              } of Cæsar (B. G.) and as much in excess of this
4. Cæsar } as possible."

After general discussion, the Section adjourned until 2 P. M.

An exhibition of old texts was given in the Classical Seminary from 1 to 2 P. M. At 1:30 Professor Barton gave an exhibition of the reflectoscope in room 120.

At 2 P. M., Miss Mima A. Maxey of Carlyle gave a paper on the topic: "What Proportion of Second Year Pupils Discontinue Latin During or at the End of the Year and Why." Miss Maxey classified the causes as they seemed to her after a detailed study made from reports of representative high schools in Illinois and said that the remedy was in the ingenuity and conscious active effort of Latin teachers. A brief abstract of her paper follows:

"To the teacher of Latin the work of the second year comes as a challenge, for, in spite of the aid offered by modern equipment and the inspiration of a large election of Latin, it presents many difficulties. During this year comes the necessity of growth in concentration in study on the part of the pupil, the urgent demand for good English and for mastery in translation. There are difficulties of the text to be met and there is the problem of the retention of knowledge previously acquired. Its greatest problem, however, lies in the loss of so large a per cent of the pupils enrolled.

Through the investigation of the records of ten representative high schools, it has been found that in Illinois the loss *during* the second year is 10% of the enrollment. The percentage of discontinuance *during* the year varies directly as the size of the school. The *total* discontinuance for the year is 47% of the enrollment. The percentage of discontinuance for the whole year is greatest in the schools of medium size, and is least in the large high schools. The percentage of discontinuance for the second year is in no way dependent upon the percentage of discontinuance for the first year, assuming that the latter figures are approximately correct.

Discontinuance *during* the year in the larger schools where the percentage is highest is due for the most part to failure. There the knowledge of each case is definite, and failures are returned to the first year.

The seeming loss accordingly is a real gain as is shown by the high percentage that remains in Latin classes. The cases of discontinuance at the close of the year fall into three classes. First, we find pupils that drop out because of illness, graduation, or leaving school, usually to work. These cases are beyond the responsibility of the Latin teacher. The second class consists of cases due to failure or inability successfully to pursue the work. The remedy is improvement in the quality of work in the first year. In the third class are those cases led away by counter influence. Under this head we include the competition of utilitarian courses, the attraction of modern language and science, the satisfaction of some requirement, local or collegiate, for two years of Latin, and outside influence emanating from the home or some source equally powerful. The remedy for discontinuance due to these reasons can be found only in the ingenuity and conscious, active effort of the teacher of Latin."

At 3 P.M., the Section adjourned to Morrow Hall where the play "A Roman Wedding" was given in Latin by the pupils of the Champaign High School under the direction of Miss Eva McKinnie. The object of the presentation was to show the possibilities of such productions as a means of stimulating interest in students and patrons.

The work of the sessions this year centered around the second year's work. The Section appointed a standing committee to consider further the subject and to report next year.

Mary E. English, Secretary.

#### COMMERCIAL SECTION.

This section met in Room 410 University Hall, with Dean David Kinley in the chair. Papers were read by Principal T. H. Ziegler, Riverside; E. F. Burch, Rock Island; Dean Willard E. Hotchkiss, School of Commerce, Northwestern University; and Mr. H. F. Miller, Chicago Association of Commerce. These papers were substantially as given below. The general topic was "The Ideal Scheme of Study for a Four Years High School Course, Considered from the View-point of the High School, University, and the Business Community."

Principal T. H. Ziegler, Riverside-Brookfield High School, spoke in brief as follows:

The call for a discussion of the subject of commercial education courses, and in particular, a four-years' high-school course in commercial subjects, is due to the demand on the part of the business world for trained servants upon the one hand, and the call for such training on the part of pupils and patrons on the other.

Our complex civilization is calling for more and more specialization, and this call is coming to our educational system in no uncertain tones.

Young people find positions to be desired are offering themselves to those competent in bookkeeping, stenography and kindred business subjects, offered, until in comparatively recent years, only in commercial schools.

It is now time for the high school, if it would serve the community well, to provide such training.

The time has passed when to enter business, a grammar school education is adequate. Such people have found themselves stranded in a few years after they have been at work. They find their competitors for advancement have had special training for the particular work of the position which is beyond their grasp. They find they lack careful and extended training in English as well as general commercial knowledge and a broader education.

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As a measure or standard of value, it may be well at the outset to propose several criteria which may be applied to the subjects admitted into a full course in business education. With respect to each subject then, we may apply the following:

1. Does it meet the test of utility in our scheme?
2. Is it necessary to a better appreciation of the commercial subjects?
3. Does it supplement any subject to be offered in the new course?
4. Is it educational per se?
5. Will it be accepted for university credit, if offered?

\* \* \* \* \*

In the first place, let us consider the full course as it may be given with adequate conditions as to teachers and equipment. Next, the best subjects to be introduced in schools wherein only a few subjects can be given. Arguments presented for the entire course will be equally valid for the partial course.

### A Tentative Schedule of Studies for a High-School Commercial Course of Four Years.

#### FIRST YEAR.

##### FIRST SEMESTER.

English  
Penmanship  
Etymology & Spelling  
Physiography  
Elementary Algebra

##### SECOND SEMESTER.

Business English  
Penmanship & Spelling  
Commercial Arithmetic  
Physiography  
Elementary Algebra

#### SECOND YEAR.

English  
Penmanship & Spelling  
Commercial Arithmetic  
Elementary Bookkeeping  
General History

Business English  
Penmanship & Spelling  
Commercial Geography  
Elementary Bookkeeping  
General History

#### THIRD YEAR.

English & Business Forms  
Commercial History  
Penmanship

English & English Literature  
Commercial History  
Penmanship

#### SELECT TWO.

Stenography & Typewriting  
Advanced Bookkeeping  
Plane Geometry  
Modern Language  
Free Hand Drawing & Designing  
Industrial Chemistry

Stenography & Typewriting  
Accounting & Practice  
Plane Geometry  
Modern Language  
Industrial Chemistry  
Freehand Drawing & Design

## FOURTH YEAR.

Business Correspondence &  
Penmanship  
Industrial History of the U. S.  
Business Organization

Business Correspondence &  
Penmanship

## SELECT TWO.

Stenography & Typewriting  
Modern Language  
Civics  
Physics  
Salesmanship & Advertising

Stenography & Typewriting  
Commercial Law  
Political Economy  
Physics  
Salesmanship & Advertising

\* \* \* \* \*

So much for the bare outline of the course. What can be said to warrant the subjects being placed as they are?

We have recommended placing commercial arithmetic in the second semester of the first year for the reason that before the computations incident to bookkeeping are taken up and before the pupil is straining his resources to solve the intricacies of that study he shall have more proficiency in calculation. For it is invariably true that the poor student in arithmetic or penmanship becomes the poor student and the one who makes countless little errors in the work of bookkeeping. Eliminate the possibility of most of these errors by giving him a greater familiarity with figures in his first year, then in the second, when the accounting is taken up, he will do the calculations and penmanship as reflexes and have all his mental alertness to give to the new subject.

Too much time and drill cannot be given to the three R's in any course in commercial work. These are the weak places in all of our educational product as seen by men in the business world, and most of all do we wish to insist upon this point.

With most pupils poor English, spelling, writing and arithmetic are a matter of carelessness which teachers foster by permitting it to continue. In every subject teachers must insist upon correct English, whether spoken or written, correct spelling and careful writing.

In the fourth year work, salesmanship was mentioned as a part of the course. This is a subject of vital concern to the student of commerce. It is an art at the very foundation of all successful business and should find a place in the course. In a few lessons the pupil is taught the essential qualities and requirements of a good salesman; how to interest a customer in his particular line of goods; how to meet customers; how to read character and a variety of interesting and very valuable material. Sketches for studying the various sales people, the pupil may meet in a business way, their good and poor points, are all studied in such a way as to train in alertness to detect points of excellence.

The subject may be made more concrete by the teacher and class co-operating with local dealers in effecting sales through the medium of window displays which are studied in the class and then applied in this concrete way.

A further development of salesmanship can be made in a study of selling by letter. What a tremendous amount of business is done through this medium.

What can the smaller high schools do in commercial work? Very much as it seems to us. The first two years can be offered as before outlined, including perhaps the advanced accounting of the third year.

The civics and economics will probably be given in any event. The typewriting should not be attempted without a thorough equipment for the work. The industrial side of chemistry and United States history could be emphasized. Some time could be taken in the bookkeeping periods for penmanship and spelling if the latter does not find a place in the regular course. Commercial arithmetic and geography could be well added.

A word here as to the instruction to be given, may not be out of place. We will of necessity, insist upon men and women who have had special training and experience in commercial studies and pursuits. In case of the smaller high schools where it may not be possible to employ a special teacher, this work should not be

given to the least competent teacher, but rather to the most competent. The object should not be to give this work as a sop to retain dissatisfied or poor pupils in school, but rather for the strong, energetic student, for the one who is not afraid of work, hard work and plenty of it.

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This discussion was to take up the matter of studies to be eliminated from the regular courses. First of all, Latin, with no apologies. Then formal rhetoric and literature with a too detailed reading of the English classics. The question of omitting algebra, that is the pure algebra, and geometry, is a fair one to consider, although they are retained in the course herein submitted. Higher algebra, chemistry, geology, astronomy should be omitted.

It is important to keep before us the fact that a commercial course consists of three distinct subjects primarily: bookkeeping, embracing as it does arithmetic, penmanship, spelling. The fundamentals to be taught in it are: the understanding of debit and credit; a proper classification of accounts; analysis or separation of them, for example, an expense account into its elements; and cost accounting; banking and railroad accounting from the point of view of the business man and shipper, not from the point of view of the bank or railroad so much.

Second, business, the business forms, correspondence and commercial law, commercial geography and industrial history. These bring into play again penmanship, English and spelling. Third, stenography and typewriting, these bringing into practise English, penmanship, spelling, correspondence, and typewriting. With these subjects in the commercial course and the teachers alive to their opportunities a high school can turn out a product that will be a credit to it in the business world.

### Summary of paper by Mr. E. F. Burch, Rock Island:

The commercial course in our high schools has been the outgrowth of the country's as well as the student's need. With fully 65% of the graduates of our high schools seeking employment in business offices, it became necessary for the public high school to offer courses which give special training along commercial lines.

In many schools, where the commercial course has been introduced, the impression has prevailed for a time that the commercial subjects were less difficult to acquire than were the academic studies, and many weak students found their way into the commercial department. In some instances the weaker students have been advised to take commercial work, while the more talented were advised against such a course. Within the year I heard a teacher of ancient language deplore the fact that a boy of exceptional ability was studying bookkeeping, instead of the dead stuff of the Latin department that he could have done so well.

This mistake on the part of students and academic teachers has been a handicap to the commercial work in years past. Teachers in charge were forced to fix a lower standard for passing work or be discredited by both students and supervisors, and as a result have been partially discredited by the public. But happily the clouds are clearing away, and the products of the commercial departments of many high schools are attesting the good work done.

The studies of commerce are as highly educative as are those which they would eject from the academic work, and at the same time prepare the young for usefulness in the business world, as well as for the home or for citizenship.

Then in planning a commercial course, we should consider those subjects which are adapted to high schools and are necessary for the laying of a good foundation for a business training, also for the training of the hands of the boys and girls for their work, rather than the subjects that may be ejected by the adoption of such new courses.

Some of the criticisms that come from the employers of the graduates of our high schools are, that they are poor penmen, poor spellers; that they are inaccurate and slow in figures. This being the situation, we who have a part in the preparation of the boys and girls should seek to change the condition by laying special stress on these subjects.

The first year of high school should be given to this work. Penmanship needs enthusiastic teaching, not incidental notice, not only during the period set apart for that work, but in all the written work of the school. Spelling should receive like treatment. We should set apart a definite period, with a definite assignment, and in addition let every instructor mark all written work for spelling. Both of these subjects will require constant and continued effort. In speaking of spelling, Mr. Gaylord of Beverly, Mass., says, "We teach spelling throughout the entire five years of our high school course, and then are not sure of our product."

In arithmetic the emphasis first, last and all the time must be on accuracy. It should cover the fundamental operations, fractions, common and decimal, common tables in general use, percentage and its applications, interest and bank discount. Practical problems should be used. The work at all times should be intensive, so as to develop the greatest amount of speed possible.

The other subjects of the first year should be English and history or biology. I should prefer the history, but as many schools require a laboratory science for graduation it may be advisable to put it here.

In the second year continue the penmanship alternating the fixed period with typewriting. Business English takes the place of the regular English. This includes the various kinds of business letters, and may cover the common forms of business papers. It is placed this year for the following reasons: The student, during the first year, has gained a greater knowledge of grammar, and the construction of sentences, of punctuation and paragraphing, increased reasoning power and better judgment. And then he will need to use the knowledge gained in this subject in the bookkeeping work which should be begun this year. Bookkeeping will be more efficient because of the first year's work in penmanship and arithmetic, and by teaching the letter writing and business forms in the English class instead of their being incidentally taught in the bookkeeping class. My observation has been that a subject that is taught as a side issue is usually very much neglected. The stress in bookkeeping should be thoroughly to ground the student in the fundamental principles of debit and credit. He should get a thorough acquaintance with the common forms of books in general use. Make his a general knowledge, that he may adopt any system that he may find in use.

History should be continued or be succeeded by a modern language, while arithmetic is followed by algebra.

If a school can give only two years' work I do not think that I would make any change in the course as outlined thus far, except in the typewriting, which may be omitted or increased as the conditions may demand.

The third year takes up the regular English course again which should be continued during the fourth year. Bookkeeping is finished during this year. History of the modern language is continued, geometry for those who do not care for stenography which is begun, and typewriting given full time. Both stenography and typewriting should be continued to the end of the course.

Stenographers should have the full four years of English and should keep in practise until they take a position; therefore stenography should not be started before the third year, unless more than two years are given to the study of the subject. Stenography and typewriting have usually been taken together, but there are many positions where typewriting alone is required, and there are many persons who would not make successful stenographers, so it is advisable to give a separate course in typewriting.

In the fourth year, in addition to the English and stenography, I would place civics, commercial geography, commercial law and economics. And for those who do not take the stenography, we may give office practice and history of banking.

These last subjects will demand the best thought and energy that the student can bring to this his fourth year, but will give value received for all that he is able to put into them. The student who has faithfully followed this course, will be well equipped with theory of business and training of hand to begin his apprenticeship in the business world.

But there are some other criticisms which employers make of our students. While they apply to the teaching of the course more than to the course itself I feel it is necessary to say just a word about some of them. The most common are:

The lack of a sense of responsibility; the lack of a desire to work; the lack of a willingness to obey orders. While these are faults of the home rather than of the school, we may be able to do much to curb the natural tendency of the pupils in these directions.

As a means of making our commercial departments most effective in all their parts, each should have an advisory board of, and lecture course by, the most successful and influential business men of the community. Have these men talk to the students at regular intervals on the things that are of vital interest to both the employer and the soon to be employed.

Dean Willard E. Hotchkiss, Northwestern University:

First of all, Mr. Chairman, I should like to voice my appreciation of the admirable way in which the subject for discussion is stated. I am especially pleased that we are asked to discuss a "Four Year High School Commercial Course," rather than a course for "Commercial High Schools" on the one hand, or the indefinite "Commercial Work in High Schools" on the other. We have here at the outset, an assumption that business training is to be developed, not as something distinct and separate, designed to meet a particular need, but as an integral and fundamental part of our system of secondary education. From my viewpoint, commercial and other vocational work along right lines is as much needed to uphold the essential cultural elements of high school training as it is to meet specific vocational demands.

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I have tried to express the conviction that any plan for business training in secondary schools must articulate with the system of secondary education as a whole. Moreover, in considering the subject from the viewpoint of the university, I shall have in mind primarily university education in general, and only secondarily university training for business.

It is not to be assumed that the commercial course can be articulated with the whole system of secondary, and university education without some modification of the system as it now exists. I shall attempt to maintain, however, that the modifications made necessary by the infusion of the vocational element will help to safeguard, rather than to destroy the essential cultural elements in education. On the other hand, I am just as firm in the belief that the concessions to culture which must be made in inaugurating vocational work will in the long run prove to be quite as essential from the vocational as from the cultural standpoint.

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The university with whose curriculum I happen to be most familiar, now requires for the A.B. degree (and this requirement is fairly typical), two courses in English, totalling 5 year hours; two courses in foreign language, totalling from 6 to 8 year hours; one course in science, 4 year hours; one course in mathematics, 3 year hours; one course in history, economics, or philosophy, 3 year hours, making a maximum from the five required groups, of 23 out of the 120 year hours of the college course. Out of the 97 hours remaining, 30 or a whole year's work, may be taken in a professional school. In the case of Medicine and in the plan outlined for work in Business Administration, the overlapping of college and professional work practically extends the period of professional study while completing the four-year college course, to two years. When it is remembered that a large part of the elective work of students preparing for the law, ministry, and for public or social work, has a direct professional bearing, and that practically the whole course is professional for prospective teachers, it will be seen that the college is no longer in the first stages of its development along vocational lines. Even the classical languages are now pursued in the university very largely as professional studies either by candidates for the ministry or by those who are preparing to teach them (an eloquent refutation of the assumption that culture and utility cannot be combined).

The two classes of students for whom the university has offered no adequate professional training in the past have been the prospective business men and the women who are to be the home-makers of the coming generation. This lack is to be attributed largely to absence of demand, but the need is now recognized and the

universities are taking steps to meet it. With the development of courses in business administration and in household administration, and the articulation of work in these fields with the college course, vocational needs in the field of higher education will be fairly well supplied.

When the universities have adopted the same liberal policy with respect to entrance requirements as the one pursued in adjusting their own curricula, one of the serious obstacles confronting the high schools in their efforts to develop along vocational lines, will be removed. The University of Chicago, I am informed, has already done this and more. While I am one of those conservative progressives who do not object to going somewhat more slowly, I am hopeful that my own university, at its next faculty meeting, will extend the number of unspecified units. In the near future, the unspecified units should be increased to one-half of the total number required. This will surely happen at Northwestern and elsewhere as soon as any considerable proportion of high school graduates come from vocational courses of acceptable scholastic content.

There are many reasons, some of which I shall later try to present, why the high school may wisely adjust its four year commercial course to meet reasonable college entrance requirements. The changes in requirements for admission just suggested, are not put forth with the thought of placing the remaining specified subjects or groups on a new cultural pedestal, nor do I assume that the changes will bring us to a state of permanent equilibrium. My thought in adhering for the present to certain definite requirements has to do primarily with the vocational efficiency of the commercial course. It may be expected that the specified entrance requirements will be substantially as follows: English, 3 units; foreign language, 2 units; mathematics, 2 units; history and civics, 1 unit. English, all will admit, should figure to this extent in the commercial course, irrespective of college requirements. If it is conceded, as I believe it should be, that the purpose of the four year commercial course is to educate men for business rather than to drill them to the performance of routine tasks, it may well be urged that the amount of general education represented by the above requirements will be essential to the best preparation for business success in the future.

Success in responsible business positions depends upon the ability to think straight concerning situations involving many elements outside of the immediate field of the business operations concerned. More and more, leadership in business is demanding a breadth and many-sidedness, the foundations for which it is the province of education to supply. From this viewpoint, the maximum of preparation for business will not be secured by confining the pupil's attention during his high school course to the study of those specific things with which later he will be directly occupied. Considering the social environment in which the business man of the future is to do his work is it not to be expected that he will be not only a better citizen, but a more efficient producer if along with his vocational work he is given a general educational equipment calculated to broaden his horizon and to enable him to think in the larger terms which citizenship and efficiency under present conditions demand?

If education means anything at all, its function essentially is to make bigger, broader, and more effective men and women. This, to my mind, is its cultural side, and it applies as much to preparation for business as it does in the so-called "learned professions." With this function is united the task of making men and women better able to find their proper place in the world and to do their work with a larger service to themselves and to mankind. This in the broad sense is the vocational side of education.

No one would deny that from the vocational side there are some subjects in the high school curriculum which for the majority of pupils are less likely than others to be directly applicable to the task of earning a living. But I submit that any high school subject, whether or not among those just enumerated, which is taught in such a way that the student discerns no relation between it and his later life, would better not be taught. A large part of the effort to vocationalize the high school may well be directed toward a change of attitude concerning the subjects pursued. Both in the high school and the college, we have encouraged the assumption that subjects are to be classified either as vocational or cultural with the result

that the subjects which fall in the cultural class have been presented in such a way as to emphasize their detachment from real life, when frequently they might have possessed a very real vocational value had they been presented in such a way as to emphasize that feature. I am persuaded that this fact in itself, has been a large influence in eliminating pupils who otherwise might have gone on for the high school or even the college course.

With respect to the subjects relating particularly to business, that is, those subjects the vocational bearing of which is obvious, it is my opinion that they should be required to establish their right to a place in the program of study for the four-year commercial course upon cultural or disciplinary, as well as upon, vocational grounds. By that I mean, that we should not give the name of vocational education to mere practise work for performing routine tasks, but that there should underlie every course of instruction a body of principles, the mastery of which will make for the development of physical, mental or moral activities, and for a broader and better individual. Given such a body of principles, thoroughly and scientifically presented, I see no justice in denying the term "cultural" simply because the knowledge obtained from a course of study is likely to be useful in getting a living.

The course made up as has been suggested, then, would consist of two parts, essentially equal, measured in terms of high school units. The first part we might call primarily cultural and incidentally vocational; the second part, primarily vocational and incidentally cultural. If this plan is followed there is reason to believe that the introduction of the so-called vocational studies into the secondary schools, in addition to attracting a large number of the pupils who now drop out before high school, will materially increase the efficiency of our secondary schools in preparing those pupils who continue their study beyond the high school course.

It goes without saying that we must permit neither the pursuit of general subjects nor the emphasis of disciplinary or cultural elements in special subjects to militate against the thoroughness and accuracy which business efficiency demands. From this standpoint, business men with much justice, may criticize our schools of whatever grade, at the present time. However, to assume that the remedy for this lies in a limitation of the curriculum or in an emphasis on fact as against principle, is to fail to grasp the function of education. It is not to be denied, however, that the development of some of the subjects which must find a place in the commercial course will help to correct this fault. This is particularly true of accountancy. It is clear that emphasis on principles in a subject of this sort would lose much of its point unless it were accompanied with an insistence on the most minute accuracy. On the other hand, thoroughness and accuracy will acquire a practical emphasis in connection with accountancy work which could never be enforced with the same effectiveness in the study of business arithmetic as a detached subject.

If in attempting to outline the kind of a course, I have in mind, I call attention to particular business subjects which seem to me appropriate, I do not wish to imply that all these subjects can be covered in the time available, nor to express any opinion concerning the relative emphasis which they should receive. Whatever subjects are included, the vocational elements of the course should be distributed over the whole four years so that the business subjects will be pursued in conjunction with the general subjects required for college entrance. A student leaving school at any particular time, should have the benefit of both elements in the course as far as he had gone.

Mention has been made of accounting. As soon as the high school commercial course has become standardized, I see no reason why it should not be possible to go beyond the formal bookkeeping, and cover the general principles of accountancy upon which bookkeeping methods are based. At the Northwestern University School of Commerce, the work in accountancy preparatory for the C. P. A. examination now extends over three years. It would perhaps be possible to cover substantially the first year of this work in a commercial high school. Either in connection with this, or better perhaps as a separate course, some of the more fundamental principles of business law should be taken up. This should represent about the equipment which the general business man would need.

The next subject of fundamental importance which I would suggest, would be a study of our own resources and, in connection with this, of the general organiza-

tion of trade, including the outlines of our transportation system. As soon as the subject becomes somewhat better developed, I believe also the internal organization of typical business establishments might well receive attention in the last years of the course. I see no reason, moreover, why the general principles of economics and finance might not be presented in an elementary way to high school students.

The general English work referred to elsewhere, might profitably concern itself in the later years, or perhaps in a fourth year course, with the study of business correspondence.

There should be no objection to including in the course the general principles involved in subjects preparatory to specific positions, such as stenography, but I do not believe it is wise to absorb any large portion of the time covered by the four year high school course with the later practise work necessary to develop technical efficiency in subjects of this kind. Opportunities to pursue these subjects should be offered to pupils irrespective of their ability to enter the complete commercial course. They may well find a place either in continuation classes or in special classes organized for the specific purpose.

It will be observed that several of the subjects just mentioned are those ordinarily pursued in university courses. I believe there is no fundamental objection to this provided the approach to the subject and the method of presentation is suitable to high-school work. It is obvious that the time available for purely commercial work will not make possible extended study in all of the subjects enumerated. The selection, however, with rare exceptions, should be made for the whole group by the school authorities and not by the individual student. I believe it will be necessary for high schools to lay out several different courses, among them the commercial course, to meet different vocational needs, and that all of these courses should as far as possible be kept on a par from the point of view of scholarship and reputation. Within these courses, however, the curriculum should be essentially the same for all students.

The common interest and group spirit which develops as result of pursuing work in the same classes over a period of four years is, in my opinion, an essential element in high school discipline, and the division into groups made necessary by vocational demands is as far as we should go in undermining this influence. It is in the unity of the course and in the method of presentation of subjects rather than in the differentiation between subjects that I would distinguish the high school from the university course.

I have purposely emphasized the relation of the high school commercial course to the general course in the university. Let me point out very briefly how it would articulate with university training for business. There are now university courses in commerce of, roughly, four kinds; the graduate school, like the one at Harvard University; the combined liberal arts and commerce course, extending over four or five years, two or three years, as the case may be, being devoted to specialized work; the course entered upon immediately after high school, the Wharton School of Commerce and Finance, University of Pennsylvania, being the best example of this class and, finally, courses essentially in the nature of extension work like the ones now offered at New York University, the University of Pennsylvania and the Northwestern University School of Commerce.

The relation of the high school course to the graduate, and the combined commerce and liberal arts courses, has already been covered in discussing its relation to the general college course. The courses requiring high school graduation have given to the term essentially the same meaning as it has with reference to the admission to the general college course. The courses which I have called extension courses, are usually given in the evening and are particularly for men who are employed during the day. Their standards of admission vary somewhat, but so far as they lead to academic recognition, it is probable that the high school requirement will be generally enforced in the future. It goes without saying, that in all of these cases, the persons responsible for administering university schools of business, would welcome a high school commercial course of the sort outlined, and so far as their relation to the general college course permits, would give it full recognition for entrance to their work.

Lest in emphasizing the college entrance feature of the commercial course, I be accused of seeking to perpetuate the old evil of the educational system for the two at the expense of the ninety-eight, I should like in conclusion to dwell on what appear to me the essential educational bearings of the subject before us. We all agree that our school system must be vocationalized. An equally important task confronting us is to weld the divers institutions which have grown with little common purpose into a unified system of national education. To add new elements of diversity, however alluring the immediate results in prospect, would be fatal retrogression.

In promoting vocational work, whether in commerce or elsewhere, it is well, as a first step, to inquire what should be the dominant thought underlying a system of education suited to American needs and in what relation will its various vocational and cultural elements stand? Unless we base our purpose and our working plan upon some fundamental concept of national education, there is grave danger that our efforts to apply in this country a scheme of training which has been successful abroad may lead to results which, though immediately useful perhaps from the viewpoint of productive efficiency, will rest upon a false educational basis and ultimately fail because they are out of joint with American institutions.

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At every stage from the first grade to the university, one of the great objects of the school system should be to discover the peculiar aptitudes of individuals and to encourage the development of those aptitudes in such a way as to render the greatest services to the individual concerned and to the community. It is an open question whether the selective function of education is not more important than the work it does in actually training men and women for their future careers.

From the viewpoint here set forth, I see no reason why the so-called vocational subjects should not be introduced in the high schools and in the grades without in any way undermining the efficiency of those schools in preparing for further work those pupils whose period of study is to be prolonged. It is a case for adjustment all along the line, so that the student who drops out of school somewhere between the grades and the university will have secured as good a preparation for his future work as possible in the time he was able to remain at school, without having the opportunity or the encouragement for further study curtailed. The elements which this best possible preparation at any stage should contain may well vary in individual cases. But I submit that we may hope for no wholesome solution of the problem by assuming in advance that culture is to be the portion of one child and utility of another.

In Illinois the problem is directly upon us. It is suggested that we establish a separate school system; essentially that we import a foreign system, the implications of which in many regards conflict with American conditions. Before action of this sort has barred the way to a rational modification of our present schools, all who have this matter at heart should unite in bringing their view to bear upon the existing situation. We may differ concerning the extent to which old subjects are to be replaced by new; we may not agree as to the wisdom of emphasizing utility at the expense of culture, but if culture means to us what it does to the artist, to the musician, and to all those on whom we depend for its development, if we recognize in it something which stands in a vital relation to the realities of life, we all ought to unite in promoting a reorganization of our secondary schools based upon the broad principles of culture for use.

A general discussion followed.

Mr. Smalley, of Danville:

"Will it not be advisable to separate the incoming students into three classes? If they wish to be trained along vocational lines we might ask them this question: How long do you feel you can give to your education? If they answer two years, we can then give them a

course which is almost exclusively devoted to strictly commercial subjects, laying perhaps a little more emphasis upon English than is ordinarily put upon it in the business school.

"If they answer, four years but no longer, we could give them training which would include the business courses and more of the general cultural studies.

"If they answer six years, we would give them a general high school course, and advise them to go to the business school at the close.

"How does that strike you for general discussion?"

Miss Van Der Neen, of Joliet:

"I have been interested in the Chicago situation, and have very definite notions about the length of the commercial course, what it should include and what ought to be done in it. I was interested particularly in an address in Joliet, at the Steel Works Club, by a man from Wisconsin [name not given] on vocational training.

"The thing that has impressed me the most, is that all these men are so perfectly certain that it takes training to become a carpenter or a bookkeeper, but none at all for the teacher; that anybody who understands carpentry or bookkeeping may teach acceptably, although anybody may be able to pound a nail or keep a set of books. Personally, I think so much of the profession of teaching, and real teachers are so rare, that that feature of the Chicago recommendation struck me as most absurd.

"Another feature of the Chicago recommendation is that processes of manufactures be taught. I had quite a discussion with one of the members of my board at home. I said something like this to him: that unless one were a teacher I saw how easy it was to feel that a particular subject was the only thing that the schools ought to teach. So if I were a milliner I should think it a burning shame that the schools did not teach the children how to make a hat. . . . It is more possible to teach the boy to sew than it is to teach him all the processes of manufacture.

"I notice that this paper urges the fundamentals. I don't think that the recommendation of the committee does. I believe very strongly in a very definite, clear, old fashioned drilling in fundamentals. I have fought strenuously against the introduction of a sort of "half-baked" bookkeeping course in freshman year for those who are only to stay a year.

"I like the suggestion that so far as we go the preparation be such that we can build something else upon it. In my home town they teach

bookkeeping in the freshman year. I think they did as much in three years as we do in one. I had a boy come to me from a high school in northern Illinois. He said that he had three years' of bookkeeping. I told him that I did not know what to do with him, as he had probably done everything we had and more. But he wanted to work. There was a set in the back of our book that we had not taken. He said he would like to try it. He said one day that he had finished it. I looked at his work, and drew a red line through some misspelled words. No one had said anything to him about spelling before. His double ruling and ledger work was the most slovenly I ever saw.

"I believe in fundamentals. I am a veritable old maid in teaching fundamentals, and I tell my pupils that business men are still more old maidish. I insist on all things that make a habit. Our grades are overloaded with unnecessaries for which the necessities are sacrificed. Business men are unwilling to pay teachers the salaries to get the results they want. I should put the best teachers I had in the fifth grade, and let the high school take care of itself. It could not spoil the product of such grade work. The business man is responsible. The last thing on earth he appreciates is good teaching.

"I am an enthusiast about the business asset. If I had a pupil do a thing I should have him do it simply as a business asset.

"I wonder whether object lessons of high honor are not worth more than precepts. I know one man who never works one stroke while the heads of the firm are out, and he would do various other dubious things, and that man was taking his lessons from the head of his firm."

Mr. Burch of Rock Island:

"In answering Mr. Smalley's first question, I do not think we should give too much business in two years to a boy in high school. I rather like Mr. Miller's suggestion that we give a few things and give them well. I would not put bookkeeping in the first year. When I went to Rock Island it was there. I have succeeded in pushing it up a half year, and if my plans do not miscarry I shall succeed in getting it up another half year within the year. It is necessary to put more training on arithmetic. The grades are not doing what they ought to do, but I cannot change that. I have to take the product as it comes. We give a few years to arithmetic, and are going to give more. We have to give more. In pushing bookkeeping up, if we give only two years of it a pupil would get only a year of bookkeeping if he stays two years. Let him get all he can out of a year. Don't try to give him much of it."

Prin. G. R. Swain, Lockport Township High School:

"How much time should be placed upon the work of arithmetic, how much upon business correspondence and spelling?"

[Name of one replying not given:]

"In answering the general question regarding the time given to commercial arithmetic, I should say that the discussion gives that subject another year. We might give a little more training in accuracy, etc., so as to benefit the pupil when he takes up bookkeeping in the second year.

"As to penmanship, it seems to me that in the first year penmanship and spelling ought to take five periods a week. It would be a small matter to give a class work in penmanship covering thirty minutes and twenty minutes in spelling. It seems to me that from the writing that has been exhibited this morning, and the writing we are all too familiar with, that would not be too much time to give to that—five times a week for the first two years, and then one or two times a week for another year."

President Felmley, of Normal:

"I do not like the answer that was given by the speaker from Danville about the boys who want two, four and six years of work. I think it is very well to fix our eyes on some definite goal. We may change our minds when we grow older. You notice that when students come to the University and know that they are going to be lawyers, or civil engineers or physicians, that they work a great deal better than the young fellows in the liberal arts course. I noticed that especially in my own college days. When we discovered what we were going to make of ourselves we had a motive that we did not have otherwise. You know Mr. Schwab is greatly ridiculed among teachers because he thinks boys should go to work at 17. He thinks if they wait until they have finished their college course they are unfitted for work.

"I have a boy who is 17, who has practically decided to be an architectural engineer. He is headed that way. He gave up his whole vacation to work in an architect's office without pay. I know that his studies in certain lines have a reality to him that they would not have if he waited until he got through college before taking it up.

"Does he want to gain culture? We must not shut it away from the boy that takes a two-year course. In regard to this, I think that we want teachers to teach these various vocational subjects. I am president of a school whose special business it is to make teachers, and I don't think there is such a thing as a teacher in the abstract. You can't use a knife

and fork effectively without victuals on the plate. I believe that to teach we must teach something. If I wanted to teach a boy to make a rabbit trap I would not send for a teacher in the abstract, but I would send for some one who had made rabbit traps, and I would expect the boy to learn from seeing it done. I believe with these men who have wrestled with this problem . . . . that a person cannot teach vocational subjects unless he is thoroughly versed in the technique of that subject; that a teacher who has learned other subjects is not going to be a good teacher.

"I think we find teachers who have begun well and been tempted to turn aside by hope of reward in the commercial world, and who, after being in the commercial world for a while are brought back by their strong love for the work, into teaching again. If we find a man of that type he is the ideal man to teach business education in all its aspects.

"With regard to the matter of penmanship, and how much time to give that. Boys that come from the eighth grade differ as much in their ability to write and spell as in almost anything else that can be named. Are we going to keep those who can write and spell, writing and spelling a year? Spelling is a gift. . . . We should have a minimum standard of excellence and they should be relieved from any more specific drills in that matter.

"The truth is we must organize courses, and that, I think, is the great point, that shall be more than mere business college courses. We want to organize courses that have in them this broad sweep of knowledge of great world processes, the processess of the industrial world. Commercial geography loomed up to me as a great subject in a commercial school. Economics should have a large place. The real training if the boys themselves are to become business men should be in this larger field."

Mr. Ford of De Kalb:

"When will our State of Illinois provide some way of training teachers that are not born to teach? Where can we get teachers to teach bookkeeping in high schools? I hear this question often, and I am so tired of answering it that I don't answer any more. There is the question, too, of what to put before the boys and girls to get the best results while they are with us. I want to have good honest products, so that when boys come out from among us they have something that is worth while.

"I am going to ask the chairman that we may have some sort of synopsis or outline of an advised course of study. What is the concensus of opinion as to what such a course should be? It would be worth something to us.

Dean Kinley: "Can you suggest any way of getting at that?"

Mr. Ford: "We might appoint a committee."

President Felmley: "Superintendent Blair is very strongly of the opinion that something must be done to improve our commercial teaching. We need an understanding of what is to be done in the normal school. The training of teachers, Mr. Blair thinks, is one of the vital prerequisites of development of our high schools."

Mr. Ford: "I move that two members of this conference who presented the first papers, and one other appointed by the chairman, be a committee to formulate an outline of a commercial course for our high schools."

Committee: Mr. T. H. Ziegler, Mr. E. F. Burch, and Mr. J. A. Ford. To consult and make report at their convenience.

Dean Hotchkiss, of Northwestern:

"As to this question of honor, and general attitude, it seems to me that they ought to be taught in connection with the question of accuracy, the question of the use of language correctly, the question of use of your pen with some degree of facility. It is not a matter alone for the teacher of those particular subjects. As it was just suggested we are doing a great injustice to many pupils if we insist on a course which all will have to take. All those things are not only a question of attitude in a business office, but the personal attitude on the part of the teacher. For instance, in high schools in Chicago they are teaching bookkeeping methods in many schools, that were used fifty years ago. The pupils know perfectly well that the teacher is not on his job. That attitude on the part of the teacher is going to reflect itself upon the pupils, and they are going to feel that it is not necessary to be on their jobs. I don't believe in employing subjects that are old. To put in a new subject does not imply that we are going to stop emphasizing spelling, arithmetic, honesty, accuracy and all the other qualities that make successful business men. We ought to do it, of course, in the grades. The high school product comes from the grades. The universities have to make up most of the deficiencies.

"With reference to this question of teachers who know their subject I don't believe we can generalize. Take the question of accountancy.

We had to get an accountant. We had to get a man who had some idea about presenting the subject. We were especially successful in finding a man to do the work. There are a great many accountants who never teach.

"We got one of Dean Kinley's products who had a sense of the scientific way of going at things, and turned him loose last year on the subject of business organization. He spent part of the year conferring with the business men in Chicago, Mr. Miller among others, trying to find out what their system of organization was in business. I think he has worked out a better course in organization than any one man would in any particular organization of any particular business. One cannot teach unless he knows the subject. Some subjects have to be learned by actual experience in business. Some subjects never can be learned by experience in business, because it would take two or three life times."

Reports of committees were called for.

The committee on permanent organization reported as follows:

1. That the report of the committee on courses of study be the subject of discussion for the commerce section at the conference in November, 1913.
2. That the committee on courses of study be requested to prepare their report by October 1, 1913, and that copies of said report be placed in the hands of the permanent organization committee immediately thereafter, and that the speakers at the conference be requested to discuss various phases of the report.
3. That the committee on courses of study be requested to co-operate with the committee on permanent organization for the purpose of securing a full consideration of the proposed courses of study at the 1913 High School Conference.

It was suggested that stenography and typewriting units be recommended for adoption by the University.

#### DOMESTIC SCIENCE SECTION.

The Domestic Science section met in the Woman's Building November 22, 1912, with Miss Bevier presiding and Mrs. L. W. Robbins, of Springfield, as secretary.

After the minutes of the last meeting were read, the report of the executive committee which outlined the work of the past year was given. The report was in part as follows:

The work of the committee has been along the following lines; the first five looking forward to the revision of the syllabus.

First, Outlining work for the grades. The purpose in making this outline has been two-fold: to encourage and unify the work below the high school; and to have before us when revising the high school syllabus the work which can suitably be done and is done by girls of the elementary school and is needed by them whether they go or do not go to the high school.

Second, Adding to the material of the syllabus and arranging it according to years in the high school course.

Third, Summarizing the reports from the teachers who have systematically tested the sections of the syllabus.

Fourth, Continuing the work of finding the best time and place in the high school for domestic science by studying many curricula. The data from four different studies do not warrant one in saying "this is *the best* time and place," but they are at least suggestive.

Fifth, Revising the definition of one unit of entrance credit in domestic science to allow credit for one full year of work in clothing if the work is preceded or accompanied by one-half year of drawing. To the definition then of one unit of entrance credit would be added the third possibility, i.e., an equivalent of 180 periods of prepared work with at least one recitation period a week in clothing, will be accepted as a unit's work if preceded or accompanied by one-half year of drawing.

Sixth, Planning the program for the present meeting. It has seemed desirable that our program this year should be an informal discussion by the many teachers who are working on the problems outlined above. The members of the committee will open the discussions by putting before the session the results of the work of the year.

Seventh, The planning of the work for the coming year. The work of revising the syllabus must be continued. A need is felt for assistance in correlation of art and our own work. An art talk is thought of for next year. Another problem for us to attack is: "What are the most effective methods of teaching the subject matter of the various sections of the syllabus?"

The contributions of the many have been appreciated by the committee.

In connection with the report, Miss Pincomb gave the following summary of the time and place given to domestic science in high school curricula:

In an effort to determine the practice in placing domestic science in the curricula of many high schools, four groups of schools were studied. These are indicated as studies nos. 1, 2, 3 and 4.

Study no. 1 represents 76 Illinois high schools which responded to a questionnaire, the school year 1911-12.

Study no. 2 represents 141 high schools in 26 different states which responded to the questionnaire mentioned, the school year 1911-12.

Study no. 3 represents 35 high school courses given in various parts of the United States. It represents high schools sending out catalogs showing extensive courses in domestic science and domestic art, hence a selected group.

Study no. 4 represents 54 Illinois high schools which responded to a questionnaire, the school year 1912-13.

From these studies the following summary is made regarding the time and place given to domestic science and art. In interpreting the data "central tendency" is used as meaning the median or "the measure above and below which exactly fifty per cent of the cases lie".

*Time in number of years:*

The central tendency as to the number of years in Illinois is: for the home,  $\frac{1}{2}$  year; for food, clothing, science and art, 1 year each.

The central tendency in schools of the selected group is: for American history and civics or economics, 1 year; for the home,  $1\frac{1}{2}$  year; for science and food, 2 years each; for clothing, 3 years; and art, 4 years.

*Time in number of periods per week:*

The central tendency in Illinois is: for clothing and home and art 5 periods per each week; for food, 7; and for science, 8.

The central tendency in schools of the selected group is: for food, clothing, home, science, art and economics or American history and civics, 5 periods per week each.

*Total time in high school course:*

Considering total periods given to domestic science and related subjects per high school course, the central tendency in Illinois is to give most time, in order, to food, science, clothing, art, and lastly home.

Considering total periods per high school course in unit value, the central tendency in Illinois is: for the home, .6 year; for art, .8 year; for clothing, .9 year; for science, 1 year; for food, 1.1 year.

Considering total periods per high school course the central tendency in the selected group of schools is to give most time, in order, to clothing, art, science, food, home, and lastly, economics and American history or civics.

Considering total periods per week per high school course in unit value, the central tendency in the selected group of schools is: for

clothing, 1.9 years; for art, 1.7 years; for science, 1.5 years; for food, 1.3 years; for economics and American history and civics, 1 year; for the home, .7 year.

Considering total time given to food, clothing and home combined, the central tendency is: in Illinois for 2.6 years, approximately  $2\frac{1}{2}$  years; in schools of the selected group, 3.9 years; approximately 4 years.

Required science to the extent of 1.5 units runs through 2 years.

Required art to the extent 1.7 units runs through the 4 years.

### *Place:*

The place which is most favored by the Illinois high schools studied is: 1st year, clothing, science and art; 2d year, food; 4th year, home and civics. The only difference shown by the schools of the selected group, is art in the second year.

### *Practices of schools in the selected group which are significant:*

1. Domestic science in each of the four years of the curriculum.
2. Approximately four years of domestic science as a full subject (unit subject) which means that  $\frac{1}{4}$  of the school time is given to the work.
3. Requirement of science by 85%; of art by 65%.

On comparing the central tendency in actual practice in Illinois, with the recommendations of this section and with the central tendency of the schools of the selected group, it would seem that more work in food, clothing, home, science and art is needed in the schools of Illinois.

The favored placing of domestic science and related subjects in the Illinois schools studied, is the same as that recommended by this section. More light on the subject of the "place in the curriculum" would be gained by a serious study of values of the various subjects in the high school course.

The course in sewing and cooking for the elementary grades was next discussed. Outlines for sewing in the fifth and sixth grades and cooking in the seventh and eighth grades were given out. Miss Alice Treganza of Bloomington, opened the discussion with the following remarks:

I wish to repeat the statement already made that the purpose of the committee in making this outline is two-fold; to encourage and unify the work below the high school; and to have before us when revising the high school syllabus the work which can suitably be done by girls of the elementary school and is needed by them whether they do or do not go to the high school.

The committee thought that by giving the detail we could see more definitely what has preceded the high school work and would know what we had to build upon, when revising the high school syllabus.

We believe there is sometimes too much stress placed on the science and not enough on technique in the grades, although we know that we cannot separate the two in our work. We wished to show that there is not enough time for much, even simple, science when the technique is well taught, thus leaving over for the high school much material that eighth grade girls could comprehend but have not time for.

"Work to be Done" and "Technique and Reasons to be Learned" seemed to stand for just what we wanted in the outline and there were no objections made to these headings.

We have placed the lessons in the sequence chosen, because we thought it better for them to spend enough time on one material or class really to know something about it than to go over the whole field in one year and then go over it again the next year.

You will notice that the housekeeping lessons are scattered through the year instead of being placed together. We had two reasons: first, the children would have time to practise the lesson studied at home and at school, before taking another housekeeping lesson; second, everyone who has taught grade children knows it is difficult to keep them interested in anything but cooking during the cooking hour, week after week.

Some of you do not have two years each in domestic science and domestic art, but I do not see how we can cover the subject in one year with one lesson a week. I am earnestly in favor of two years in each study.

We know that conditions throughout the state are not the same for our work in the grades. Therefore, each teacher will need to adapt any outline that may be provided, to her own needs or the needs of her school.

The work has been planned with the thought that a special teacher should teach the sewing and cooking

The feeling of the committee is that this is a mere beginning. It is presented to you for you to pick it to pieces and to make suggestions concerning it. Then, after its reconstruction, we will have something that is representative of the section, rather than of the committee.

Any suggestions concerning heading, sequence, time or content will not only be welcomed but are begged from you.

The following are the first four of the lessons outlined for fifth grade sewing.

## Fifth Grade Sewing.—60 Minutes per week.

|                  |                                      |
|------------------|--------------------------------------|
| Work to be Done. | Technique and Reasons to be Learned. |
|------------------|--------------------------------------|

- |  |   |
|--|---|
| 1. Sewing bag<br>Selection of<br>materials | Size of bag suitable for purpose; quality, design, color, cost, width and amount of material; equipment of work-box; story of the manufacture of thimble and scissors; use of these tools; importance of cleanliness.   |
| 2. Straighten fold<br>and baste sides      | To straighten material by tearing; how to tear; to tell the up and down or warp of cloth; to straighten cloth by stretching, meaning of $\frac{1}{16}$ , $\frac{1}{8}$ , $\frac{1}{4}$ and $\frac{1}{2}$ inch; to measure with ruler or paper gauge for width of seams; size of needle and number of thread suitable for basting; length of thread to use; to thread needle and make knot; to make the even basting stitch. |
| 3. Sew seams of bag                        | To make running stitch; to sew in a straight line; depth of seam; amount to be left for hem; to fasten thread securely and neatly; to keep a healthful position; to know good light exposure; to hold work conveniently; to remove bastings.  |
| 4. Overcasting seams                       | Reason for finishing seams; appearance of overcasting on right and wrong side; size of stitch; how to hold material.  |

The remaining work outlined for fifth and sixth grade sewing included the making of a needle case, napkin ring, sewing apron, circular button bag, napkin or bib, stocking darning, mending of cotton garments, tea towel and holder, case for silver, guest towel, mending woolen garments, circular pincase, doily and apron for cooking class.

Much discussion followed. Objection was raised to making an apron in each grade. Smaller articles were suggested. A plea was made for machine sewing in the grades, the idea being that the needed muscular control should be learned by girls of sixth-grade age; that the great repetition in such hand work as making seams and hemming is not essential but irksome; that interest is greater when one article is not worked on for several months. Several teachers reported that one sewing machine is gradually being placed in each school building. A special room and a special teacher were considered most desirable.

Home work was objected to very decidedly. The objections were these: the work may not be the pupil's; directions may not be followed

and in the end, time lost; pupils may forget to return the work; there may be considerable danger of infection in case of sickness in the home.

The following are the first four of the lessons outlined for seventh-grade cooking and housekeeping.

### Seventh Grade Cooking and Housekeeping.

One double period per week.

| Work to be Done                  | Technique and Reasons to be Learned.  |
|----------------------------------|---|
| 1. Put kitchen in order          | To clean utensils that have been stored; order for utensils; location of supplies; need of cleanliness of person; suitable dress for kitchen.   |
| 2. Lemonade or other fruit drink | Need for washing fruit; squeezing lemons; measurements needed for lesson; common abbreviations used; to wash glasses and dishes; to care for knives used in cutting fruit; to care for towels and room. |
| 3. Stew fruit                    | To pare fruit; economy in sorting fruit; order in work; economy in use of gas.  |
| 4. Bake fruit<br>Dry fruit       | To core and quarter an apple; to light and regulate oven; proximate composition; use of water in the diet.  |

In discussions, emphasis was placed on the need for teaching reasons for doing, i.e., of teaching the pupil to work intelligently. The average cost of cooking lessons in the grades was given as 2.6 cents per pupil.

The arrangement of the "food," "clothing" and "home" parts of the high school syllabus according to years in the curriculum was next presented by the committee. The following plan is given as a summary:

First year. Clothing. The present material of the clothing section of the syllabus with the omission until a later year of "house-hold fabrics and articles," "millinery," "laundering of clothing," and part of the "cost of clothing"—that part necessitating knowledge of the cost of articles not yet made and the total cost of living. Civics and economics as related work must of necessity be omitted in the first year.

Second year, Food. The present material of the food section of the syllabus through "summary" on page 28, with the omission until a later year of "special preparations for the sick" and the study of details concerning food value, and the relation of cost of food to the total cost of living.

Third year, first half-year. Clothing. Material suggested is millinery, the making of a wool dress, household fabrics and articles, the

study of materials used, drafting patterns, making suitable designs, the cost of clothing and care of clothing including laundering.

Third year, second half-year. Food. The present material of the food section of the syllabus from the beginning of the "summary," page 28, to the end of the food section, i.e., the study of the value of food in relation to the needs of different individuals, the planning of meals, the selection, preparation and service of food.

Fourth year, The Home. The present material of the home section of the syllabus with the addition of the following: the preparation and service of a few meals in connection with the care of the different rooms of the house, page 42; special preparations for the sick and convalescent in connection with the care of the family, page 44; the making of household furnishings in connection with work on page 46; and the consideration of clothing for different members of the family just before the study of maintenance of the home. Laboratory work suggested at this point is as follows: make and figure cost of garments for an infant; list wardrobe for a school girl and her mother and figure cost; make graduation clothes; estimate cost of clothing for one year for a family of six, one being a senior girl in high school.

The home course called forth most discussion. Miss Day's remarks in opening the discussion were in part as follows:

The work on the home should be given as late in the high school course as possible in order that the necessary preliminary work may precede and that the age of the girls may be such that their natural interests are broadening from these that are individual and personal into those which include the family and society.

This course is difficult to give. First, it does not afford much opportunity for laboratory work. Those who have been accustomed to teaching subjects in which the laboratory work forms a large portion of the course are apt to be at a loss when deprived of that method of making the work definite and appealing to the girls.

Second, there is difficulty in planning and carrying out visits to stores, factories, houses in process of construction, etc., so important in connection with this course.

Third, lack of text books and available reference books for students, make the giving of this course difficult.

Fourth, creating an attitude of mind in the girl. While the most important thing in the course, this is somewhat intangible and many feel that even the fourth year high school girl is rather young to respond to such teaching. When we consider, however, that comparatively few of

the girls go on to college and that many colleges give no work of this kind, it seems worth while to do the best we can in the high school and we have no right to shirk the responsibility because of the difficulty of the task. We should try all the more to find some way of making such a course practical and interesting. If we believe that home making is a profession, as we are so fond of saying it is, we should certainly give it a prominent place in the course of study, and we should remember that this implies the relation of the home to society as well as to the individual.

Some may advocate the intermingling of material given in the syllabus under the home with other work in food or clothing in order to keep the interest by having more laboratory work, but if four years of work can be given, it seems wise to the committee to keep the general idea of the home, adding some laboratory work in cooking and sewing such as giving of meals, invalid cookery and serving, making of household articles, infant's clothing, graduating outfit, etc.

Miss Day emphasized particularly the importance of helping the high school girl in her senior year to see her relation to other individuals in her home and community, to broaden her interests and responsibilities, to think of and do that which will benefit the greatest number.

Several teachers told of having successfully taught the making of an infant's outfit and the great interest taken in the work when the garments were to be distributed by the visiting nurse or similar agency. It was suggested that the complete set should be a class problem, the different articles being made by different girls.

There was a difference of opinion as to the desirability of making the graduation dress in school. A number thought we could not afford to lose the opportunity to teach simplicity, and suitable and fair expenditure of money.

The last subject for the day, "The Teaching of Millinery in the High School" was discussed by Miss Edith Welty of the Bloomington High School. Her paper in part was as follows:

"Millinery is a domestic art subject, which may be taught in the elementary or high school and may be continued through a college course. At this period in history, when it takes so much time, money and thought to have one's head properly covered for all occasions, it seems very fitting for us, as domestic art teachers, to give the girls, what help we can along this line. The problem of dress has become such a burden, that we now have to seek a way to relieve the women of tomorrow.

"The millinery work in the grades would have to be very simple, such as the making of bows and rosettes, and the placing of simple trimmings on hats. Some ideas of good line and style and good color combinations can be given to quite young girls, in such a way that they will be understood and appreciated. Nevertheless, I think other lines of work can be given, which are more profitable in the grades, unless much time can be spent on domestic art subjects.

"I feel quite different about the teaching of this subject in the high school; here I consider it very important. I should give some time to the work, if only for a few hours each year or even one year. In our two year's domestic art course in the Bloomington High School, we spend one-fifth of the time on millinery. This gives eighteen lessons, of one hour and a half each, four different semesters. In this time, we make two hats and some trimmings each year. I think it best to start the fall or winter hats just as early in the year as possible, so I begin work the third or fourth week.

\* \* \* \* \*

"I think the best time for the spring work is just before the Easter holidays.

"Work for girls in any year of high school might include the entire making of fall and winter hats on buckram frames, spring and summer hats on wire frames, buckram and wire bandeaux and the making of bows, rosettes, and silk and ribbon flowers. My experience this year has proved to me, that it is not necessary to have junior or senior girls to obtain satisfactory results in millinery, for my class of twenty-four is made up of twelve freshmen, nine sophomores and three juniors. The results from the freshmen girls compared very favorably with those from the other members of the class and they seemed mature enough to grasp the underlying ideas, which I tried to present in connection with the hand work.

"Some of these underlying ideas which I think should be emphasized are: standard shapes in hats; changing styles; size and shape with reference to the wearer; suitable materials and trimmings; good color combinations; hats from an artistic standpoint in size, shape and color, and the care of hats. The comparison of the cost of the materials with the cost of hats bought in the shops, brings out the economical value of millinery. One point which I especially emphasize is, that a hat is not stylish unless it is becoming.

"I expect some teachers do not agree with me, in thinking that the fall hat on the buckram frame should be taught before the spring hat on the wire frame. I do think the problem of covering the buckram frame is harder than sewing the straw on a wire frame, but the making of the wire frame seems to me the most difficult problem in the course. In making the buckram frames, girls have some work with wire, which is of great help to them in the frame making, so I firmly believe that the fall hat should precede the spring one.

\* \* \* \* \*

"The most difficult thing, I have found in the teaching of millinery, is convincing the girls at the beginning, that they will be able to make hats good enough to wear. A teacher must know her work thoroughly and be sure of herself, so she can give confidence to her class. I have had girls come to me and say: 'I wish I had gotten better materials to work with, but I had no idea I could make a hat fit to wear.' Therefore, I wish to emphasize the fact, that teachers of millinery must be well trained and enthusiastic to get good results."

Following the discussion, Miss Welty demonstrated the method by which she teaches the buckram frame to her class. Hats made by the girls of her classes were used to illustrate points in the discussion.

The map of Illinois which was before the section, shows at this time one hundred and eleven high schools and fifty-seven counties teaching domestic science in the high schools of our state. In 1908, the number was forty-two high schools in twenty-seven counties; in 1911, ninety-five high schools in fifty-one counties.

## THE ENGLISH SECTION.

The fourth annual meeting of the Illinois Association of Teachers of English was held in the Moot Court Room of the Law School on November twenty-second, President Hosic presiding. In his opening address the president called attention to the vocationalizing tendency apparent in the English work of the high schools of the state. There is evident, he said, an inclination to stress certain kinds of work, as oral composition, and dramatics. This tendency to emphasize the kinds of work most vitally related to the daily life of the student was still further dwelt upon by Mr. W. W. Hatfield, of Chicago, who presented the report of the committee appointed to investigate the opinions of high school graduates concerning their training in English. The answers received from graduates of high schools showed conclusively that the work from which the students believed they derived the most benefit were those that furnished them with practical training for life. Out of two hundred and forty replies received to the committee's questionnaire, one hundred and twenty-three looked back upon grammar as the most valuable part of their high school training in English. Punctuation and choice of words they also regarded as of the utmost importance as compared with the lesser value of the writing of long themes, and the study of models. An interesting and significant result of the investigation was the discovery of a large amount of retrospective enthusiasm for oral composition.

Such an estimate of the value of oral composition seemed to justify the emphasis which Professor Clapp of Lake Forest proposed to put upon it during the current year. Indeed he proposed to make an investigation of the value of oral composition, as compared with written, the problem to be taken up by the Association. So much did this suggestion meet with the approbation of the assembly that the president was asked to appoint a committee, with Professor Clapp as chairman, to carry out such a plan. [Professor Clapp's plan as presented is too long to present here and does not readily admit of abbreviation. It is published as our "English Bulletin."]

During the afternoon the Association listened to the report of the nominating committee, who reported its nomination of W. W. Hatfield, of Chicago for president; and E. C. Baldwin, of Urbana, for secretary; and as members of the executive committee, J. M. Clapp, of Lake Forest, Miss Laura Tanner, of Jacksonville, Miss Florence Skeffington, of Charleston, Miss Eva Mitchell, of Centralia, Mr. Lyon, of Joliet, Mr. Shryock, of Cabondale, H. G. Paul, of Urbana, and W. F. Mozier, of Ottawa. The committee nominated as delegates to the meeting of

the National Council: R. M. Alden, of Urbana, Miss Ada Grandy, of Highland Park, W. W. Hatfield, of Chicago and J. F. Hosie, of Chicago. These nominations were unanimously approved.

After watching a laboratory experiment by Professor Thorndike of Columbia University, illustrative of a scheme of measurement of school achievement in English composition, and listening to a discussion of it by Professor Scott, of Urbana and by Mr. Franklin Johnson, of Chicago, the meeting adjourned.

E. C. Baldwin, Secretary.

Notes from the field, by the President, J. F. Hosie, Chicago:

"The Executive Committee has assigned to me the part of town crier, who must shout the latest news from all points as to how our English brethren fare. The task is a congenial one, for there is much to report, and far more that is encouraging than otherwise.

"The Committee on Composition Teaching, of which Professor Hopkins of Kansas is chairman, has continued its valuable work throughout the year, and is now ready to make a final report to the national societies which stand sponsor for it. The final results differ but little from those published a year ago. The relative teaching cost of English is found to be less than that of any other subject in the secondary schools. German and Latin cost about one-third more and science and vocational subjects from 50 to 100 per cent more. On the other hand, the average number of pupils assigned to a teacher is much larger in English than in other subjects. The figures are: English 132, Latin 100, German 101, mathematics 115, history 121, science 98, vocational subjects 101. The cost of equipment for English is also very low as compared with science and vocational subjects. The moral of these facts is that English teachers should unite in a determined effort to improve their conditions.

"Marked progress has been made in the last year in vitalizing high school English. Emphasis is being rapidly shifted from written composition, mainly in connection with literature, to oral composition, of a useful and practical character. It seems likely that a partial solution of the problem of theme reading will be found in a judicious use of oral work. The Lake Forest plan of conducting contests in extemporaneous discussion has attracted wide attention and bids fair to supplant the formal debate. Pupils are now encouraged to make plays and produce them. They examine the magazines. They practice the forms of business and other correspondence, and they write about the vocations they hope to follow.

"There has been advance also in the organization of the high school course in English as related to the work of the colleges. The committee of the National Education Association which was appointed two years ago for this purpose collected a body of opinion from high school teachers and others as to the influence of the uniform entrance requirements in English and presented this to the National Conference at its meeting on March 30 last. The Conference took steps to meet the wishes of the schools. The requirement in grammar and composition was separated from that in literature, with the hope that the basing of themes upon classics will become less common. The choice of books for reading and study is greatly enlarged. Colleges are advised to set entrance examinations which do not call for prescribed books. They are also urged to take steps to ascertain that candidates for entrance have adequate preparation in oral English. The Conference insists that four credits should be given for four years' work, and believes that English should be studied throughout the high school course.

"Meanwhile steps have been taken toward the production of a national syllabus of high school English. This is to be prepared by a joint committee, representing the National Education Association, the National Council of Teachers of English, the National Conference on Uniform Entrance Requirements in English, the National Speech Arts Association, and the Conference on Public Speaking of the North Atlantic States. When ready the syllabus will issue from the office of the National Commissioner of Education.

"College men have taken up seriously the discussion of how to improve college English from within. The last conference of high schools with the University of Chicago was devoted to criticism of the work of the college classes by teachers who had visited them, and both the National Council of Teachers of English and the Modern Language Association have arranged programs including the topic, 'The Preparation of College Teachers of English.'

"Organization of English teachers goes on apace. Seven state and two city associations have come into being within a year, and twice that number are in progress of formation. All of these, with ten already in existence, will join forces in the National Council, which has now about a thousand individual members and which has reached all parts of the country. It is through this organization, serving as a clearing house of opinion and experience by means of its conventions and its organ, the English Journal, that teachers of English will become articulate and

effective in establishing right ideas of English instruction and in obtaining those reforms in the conditions surrounding their work which are necessary to success and satisfaction."

Mr. Hatfield's report upon "High School Graduates' Opinions of their Training in English Composition" was as follows:

At the meeting of this Association a year ago, it was proposed that we find out what the graduates thought of the training in composition they had received in the high school. We are always in danger of falling into ruts so deep that we cannot see out over the great world, and this investigation was begun to discover if we were really in such a plight in our composition courses.

Two forms of blanks were sent out to teachers to be given to graduates in their vicinities. The first form, sent last spring, asked three general questions: 1. What parts of your high school training in speaking or writing English have been of most use to you in your business or social relations, or in further study? 2. What parts of it have been of little use in these ways? 3. Has your experience shown that there was something left out of your training in composition which would be of value to you now, or that something which was included in that training should have received greater emphasis? If so, what? After each question there was a blank space for answer. This note was added: "Parts" as here used refers both to such major divisions as oral and written composition, narration, explanation, etc., and to such minor divisions as the specific principles of rhetoric and grammar. Upon this form about sixty answers were received.

This fall another form of blank was tried. It bore exactly the same questions, but they were accompanied by a fairly complete list of the parts of the course, and the answers were to be indicated by setting down opposite each item in the list of parts the number of the question in answer to which it should be named. Thus a "1" after an item meant that it was included in the answer to the first question; i.e., that it was one of the most useful things taught in the course in the high school. Upon this form we have received nearly two hundred replies,

I think the first plan better than the second for two reasons. It gave a much freer expression of opinion, for when the boy or girl once started to write, a fairly full statement of the matter was likely to come out. This even extended to the condemnation of Burke and other matters not mentioned in the questions. Secondly, it limited the answers to a few items. On some of the papers received this fall, a large majority of all the items listed were marked as "most useful," because it was so easy to put a little figure after anything that was useful in any degree.

The original purpose was to get as unacademic a view of our procedure as possible. In that we have succeeded to a certain extent; that is, we have gotten the opinions of 125 high school graduates, of whom only a few are pursuing further courses of study. These answers, which are summarized in the first three columns, are the most significant for the high schools in general. It will be to them that I shall refer chiefly in the detailed discussion.

This fall it seemed wise to present the same questions to a number of students in this University and in some normal schools. By this, two ends have been gained: greater certainty of the results as a whole, due to the larger number of opinions; and a more or less valuable comparison of the needs of the student who is going on to college and those of the student who is going directly to work. Except in a few points which I shall mention as we examine the table in detail, the college youth and the worker agree very closely in the things they praise or condemn. This fact is a matter of congratulation for both the college and the high school. It indicates the problem of adjustment of the one to the other, and of both to the people's needs, is well on its way to satisfactory solution.

The second group of three columns, then, is the summary of the results from the students in higher institutions. The last three columns show the results as a

whole. In the columns marked "1" appears the number of times each item in the list was named in answer to question one, What has been of most use to you. In the columns marked "2" appears the number of times each item was included in the answer to question two, What things were of least use to you? In the columns marked "3" appears the number of times each question was included in the answer to question three, "What was left out or insufficiently emphasized?" In short, "1" means useful, "2" not useful, and "3" more wanted.

Grammar is, on the whole, most favorably viewed by these young workers. It ranks second, in the first column, fourth in the third column, and is one of the two parts of the courses which everyone feels have been useful. Not only do the students look with favor upon what they have had, but many of them want more. We may need to discount column one a little, but this demand for more emphasis seemed in every case to be made thoughtfully. What kind of grammar it is that these people want, is not so clear, for analysis and the study of parts of speech, fall very far behind the subject as a whole, especially showing in the second column. Perhaps the key to the puzzle is to be found in the comment upon some papers that the grammar should be made more practical by more application. We do not need to go farther into the niceties of our complex speech, but to apply to the students' own errors the laws they already know theoretically. I have this fall a first-year class well trained in text-book grammar who could not tell "between you and I" is wrong. No wonder they sighed when I announced that part of our work would be grammar. The same need of more application and less theory appears in the report of a co-operating investigation in the city of New York.

Second place belongs to punctuation, although spelling and choice of words are close behind. Both spelling and punctuation are matters of pure form, almost mechanical in their nature. They are the matters concerning which business men have criticised us, and now our graduates are adding their complaints. The demand for emphasis upon spelling is stronger than any other except that on oral composition. We may believe that our instruction should make our pupils better thinkers, or even that it should be a means of real soul-culture, but we must not lose sight of the fundamentals, which have to do with the bread and butter. In spite of all sentiment, the first thing to do is to secure reasonable correctness of form. It may make wooden writers, may even spoil a genius or two—if that can be done—but it is what the majority must have to be fairly equipped for work.

I speak the more strongly upon this point from the fact that right behind the spelling and punctuation, comes choice of words. This category was evidently thought of by the young people as simple knowledge of a word which would do, not the nice discrimination of synonyms. From the papers upon which it appeared, it was evident that the *blunders* in vocabulary had prompted its inclusion. Add to this the clear advantage of sentence structure over the other kinds of structure, and it seems plain that the mechanics of expression should be the backbone of our courses.

Letter writing also receives strong approval. Already in the cities we teach "Business English" and in the smaller centers the same will soon be true. Really what is needed for all, is just what is meant by "Business English," a good strong drill in the fundamentals already mentioned, with some training in letter form. The regular courses would be greatly improved by a little infusion of the breath of the market, and anything more than this is entirely outside the province of the teacher of English.

Let me for a moment, express my own opinion entirely aside from the statistics at hand. Since the majority, or a very large minority, of our students are going to leave before the end of the second year, it is unjust to them not to give a strong drill upon these mechanical matters that the world makes so much of. It is good to get the youngster's inhibition removed, so that he will write freely; it is good to warm his imagination, and to train him to see the beautiful, the picturesque, and the things of everyday life; but it is *necessary*, for him to be able to speak grammatically, to spell and to punctuate.

To *speak* grammatically! That recalls me to the table before us. In the third column, oral composition leads all the rest. That it is not so strong in the first column is due to two qualities; the fact that some students had none to find useful and the procedure in tabulation which did not include an item under both "1" and "3"

even when it was given in both places. In many cases, the figure "3" placed after oral composition or extemporaneous speaking was underlined. If there were needed any further argument for the large use of formal oral composition to replace the written themes which so harass most of us these replies furnish it. I will not remark upon the matter, lest I weary you with an old tale.

The items in the table might be grouped under three heads: Those strongly approved, those clearly disapproved, and those whose showing is significant only by comparison with that of others. I have already pointed out those which received strong approval. Let us now look at two or three groups, comparing the items within the groups.

The verdict upon debates (27) seems not at all decisive until it is compared with that upon other oral work. Viewed in this light, debating, which many of us have looked upon as one of the most interesting and profitable of school exercises, seems not to have justified our hopes. Perhaps someone will be able to explain away the logic of the figures.

Short themes (30) make a consistent though not striking showing—unless one compares this ranking with that of long themes (29). The people who have gone to work have no use for long composition, a one-page letter being the most that the majority will ever do in formal composition. Here they differ sharply from the college students who evidently find use for their ability to write at length. I suspect that this very fact underlies the weak showing of argument (No. 7) and exposition as compared with narration and description. The adult will have to argue and to explain, but not frequently, in the long, very formal fashion we usually require in the study of argumentation or exposition. In narrative and descriptive writing, we are more often willing to accept the theme of one or two pages. Narration and description outrank exposition and argument by ten to fifteen points. That may not be conclusive, but it is a big straw.

Let us make a last comparison, among the members of the last group, the different kinds of criticism. Criticism by the teacher has evidently been more efficient than the other kinds, and oral, comment in class has clearly surpassed the red ink on the papers. The lesson to the teacher who has been burning the midnight oil in frantic and largely futile blue penciling of the themes is obvious. At first, I was disappointed with the result so far as private conference is concerned, for these *workers* do not seem to have any clear opinion whether it helped them or not; but look at the report of those still in school, who have had more experience with this method. Not only has the approval expressed in the first column tripled, but the demand for more is very strong. Many of these college students who marked private conference as useful forgot that it had occurred not in high school, but in college. This does not effect the validity of the conclusion. Those who really know something about it, who had had conference hours, have found much help therein. Nothing that is so good should be withheld from the 95% of our students who go directly to work.

The real villain of the piece is long themes, already mentioned. He has as near kinsmen models (11), rewriting (13), and dictation (14). Rewriting and dictation received more negative votes than positive, and this result is repeated in the college column. A study of models escapes with its life from the hands of the employed but the college and normal students encompass its downfall. Sentiment against it is strongest in the normal schools—about two to one. Whether this normal school opinion is based upon their own experience or upon the theory there imparted, is an open question. In such company, the study of text-books seems quite popular. Its popularity is less in the college group.

We have now reached several conclusions. This investigation indicates that more attention should be given to spelling, choice of words, punctuation and grammar, especially the application of grammar to the student's own mistakes, and to oral composition. Letter writing and paragraphing are both strongly approved, but there is no considerable call for more of them. Short themes are considered much more valuable than long ones; sentence structure outranks that of paragraph or theme; oral criticism by the teacher has, in the past, apparently, been the most efficient sort. Disapproval falls upon the use of models, rewriting, dictation, criticism by classmates, long themes, and to some extent, upon debates.

| Item.                        | From<br>High Schools<br>(125) |       |    | From<br>Colleges.<br>(115) |       |    | Total.<br>(240) |    |    |
|------------------------------|-------------------------------|-------|----|----------------------------|-------|----|-----------------|----|----|
|                              | 1                             | 2     | 3  | 1                          | 2     | 3  | 1               | 2  | 3  |
| 1 Grammar.....               | 52                            | ..... | 21 | 71                         | 5     | 20 | 123             | 5  | 41 |
| 2 Oral Composition.....      | 31                            | 7     | 28 | 36                         | 19    | 38 | 67              | 26 | 66 |
| 3 Written.....               | 68                            | 3     | 18 | 84                         | ..... | 8  | 152             | 3  | 26 |
| 4 Narration.....             | 42                            | 1     | 6  | 58                         | 9     | 16 | 100             | 10 | 22 |
| 5 Description.....           | 47                            | 2     | 5  | 73                         | 5     | 6  | 120             | 7  | 11 |
| 6 Exposition.....            | 32                            | 7     | 4  | 59                         | 12    | 6  | 91              | 19 | 10 |
| 7 Argument.....              | 31                            | 9     | 8  | 40                         | 28    | 17 | 71              | 37 | 25 |
| STRUCTURE—                   |                               |       |    |                            |       |    |                 |    |    |
| 8 Theme.....                 | 37                            | 5     | 5  | 54                         | 11    | 15 | 91              | 16 | 20 |
| 9 Paragraph.....             | 40                            | 7     | 6  | 60                         | 10    | 14 | 100             | 17 | 20 |
| 10 Sentence.....             | 48                            | 2     | 11 | 67                         | 8     | 10 | 115             | 10 | 21 |
| 11 Study of models.....      | 19                            | 16    | 6  | 28                         | 33    | 14 | 47              | 49 | 20 |
| 12 Study of text-books.....  | 37                            | 9     | 1  | 39                         | 27    | 6  | 76              | 36 | 7  |
| 13 Rewriting.....            | 16                            | 23    | 2  | 27                         | 30    | 9  | 43              | 53 | 11 |
| 14 Dictation.....            | 15                            | 17    | 3  | 18                         | 24    | 13 | 33              | 41 | 16 |
| 15 Unity.....                | 52                            | 1     | 3  | 62                         | 5     | 15 | 114             | 6  | 18 |
| 16 Coherence.....            | 50                            | 3     | 2  | 59                         | 6     | 16 | 109             | 9  | 18 |
| 17 Force.....                | 34                            | 4     | 4  | 43                         | 7     | 14 | 77              | 11 | 18 |
| 18 Emphasis.....             | 38                            | 4     | 6  | 48                         | 7     | 13 | 86              | 11 | 19 |
| 19 Selection.....            | 26                            | 4     | 7  | 36                         | 4     | 24 | 62              | 8  | 31 |
| 20 Arrangement.....          | 33                            | 5     | 9  | 50                         | 2     | 17 | 83              | 7  | 26 |
| 21 Theme-plans.....          | 22                            | 8     | 6  | 31                         | 14    | 23 | 53              | 22 | 29 |
| 22 Choice of words.....      | 48                            | 1     | 18 | 53                         | 1     | 27 | 101             | 2  | 45 |
| 23 Spelling.....             | 41                            | 1     | 25 | 64                         | 6     | 24 | 105             | 7  | 49 |
| 24 Punctuation.....          | 47                            | ..... | 19 | 68                         | 2     | 28 | 115             | 2  | 47 |
| 25 Paragraphing.....         | 44                            | 3     | 10 | 60                         | 1     | 14 | 104             | 4  | 24 |
| 26 Extempore.....            | 11                            | 12    | 27 | 31                         | 6     | 62 | 42              | 18 | 87 |
| 27 Debates.....              | 23                            | 16    | 8  | 31                         | 26    | 29 | 53              | 42 | 37 |
| 28 Letters.....              | 38                            | 6     | 10 | 57                         | 12    | 20 | 96              | 18 | 30 |
| 29 Long themes.....          | 9                             | 19    | 4  | 43                         | 20    | 16 | 52              | 39 | 20 |
| 30 Short themes.....         | 39                            | 4     | 3  | 71                         | 1     | 8  | 110             | 5  | 11 |
| 31 Sentence analysis.....    | 27                            | 14    | 4  | 38                         | 24    | 10 | 66              | 38 | 14 |
| 32 Parts of speech.....      | 29                            | 11    | 4  | 33                         | 20    | 11 | 62              | 31 | 15 |
| CRITICISM—                   |                               |       |    |                            |       |    |                 |    |    |
| 33 On papers.....            | 32                            | 8     | 7  | 42                         | 19    | 20 | 74              | 27 | 27 |
| 34 Teacher, oral.....        | 40                            | 10    | 3  | 64                         | 5     | 11 | 104             | 15 | 14 |
| 35 By mates.....             | 16                            | 23    | 2  | 43                         | 16    | 16 | 59              | 39 | 18 |
| 36 Conference.....           | 13                            | 11    | 11 | 32                         | 10    | 36 | 45              | 21 | 47 |
| 37 Reading themes aloud..... | 20                            | 14    | 3  | 43                         | 16    | 20 | 63              | 30 | 23 |

Now that it is all done, the question of the validity of the conclusions arises. There are two possible sources of error. Those questioned may not really have known what parts of their training benefited them most. This objection applies particularly to matters of method. The second possible source of error is the comparatively small number of papers included in the summary.

Let me answer the latter objection, and leave you to judge for yourselves as to the other. One of the best tests of the validity of statistics, is to divide them into smaller groups and see whether each group agrees with the total. In this case, I first tabulated the university, normal and high school students' replies separately,

and found that except in the few instances I have mentioned, each group showed the same conclusions. Sometimes the proportions were slightly altered, but the conclusions were always clearly in agreement. Since this is true, and since some of the most important conclusions are reached independently by the New York commission, I feel that the results should be accepted as of considerable importance.

Upon this second set of ranks, but separated from the questions, we have been discussing, appeared this addition: Do you think the division of time between composition and literature is the best possible? What change would you make?

This question brought forth 191 answers. Twenty-four asked for more literature; 41 think no change is needed; and 113 want more composition. That nearly 60% of our students should, in after life, find themselves insufficiently trained in composition, would be a great misfortune. Make any allowance you will, discount the figures as those of a questionnaire, it is yet clear that up to the present, the more easily taught literature has absorbed more than its just share of time in at least half of our schools. If we are giving less than one-half of the English time to composition, we should consider these figures very carefully.

The Discussion of Mr. Clapp's Paper, Adah G. Grandy, Deerfield-Shields Township High School, Highland Park.

To comment on the obvious excellencies of Mr. Clapp's paper is hardly necessary. There are, however, certain points which he touched, but lightly that I can perhaps explain a little more in detail, chiefly in the hope that with an added airing of the subject, an open discussion of the question may be provoked.

Since this is pre-eminently the vocational age of education, and since the vocational idea has come and come to stay, perhaps our question should be: "How are we to make composition fall in line with the vocational kind of work?" First let us pause a moment and see if we should.

We boast of our public school system, and yet one writer says that the bulk of our education is for the one-fifth part, while the other four-fifths are pressed into molds where they don't, by nature, fit, and should we, by dint of much teaching, get them into these moulds, we would land them at graduation away from all fitness for a place in the world. To a large extent I honestly believe this statement, and I believe it too as pre-eminently true of composition. Mr. Bogan of the Lane Technical School of Chicago, before a recent meeting there of the English Club, said some remarkably sane things along this line—the things which I afterwards told him I intended to bring bodily to this meeting, so at least he was forewarned. "Can we remedy this evil," and "can we do it in composition?" To the first I would say "yes, to some extent," and to the second, that it can be best done through oral composition.

So while the primary motive of all this discussion may have been the alleviation of the overworked English teacher, it would seem clear that one of the valuable by-products will be a livening up, or renewing, or better still, a revitalizing of composition—both oral and written. To that end I am going to say some radical things in answer to the question which I already hear. "Oh yes, but how is it to be done?" Radical they may be, perhaps. I am but the fuse which will touch off some real pyrotechnics, but all of the things I speak of have been tried and with live results.

To quote Mr. Bogan, he said that one reason the average boy loathed English, was because it was usually quite remote from life as he, a healthy active boy, knew it, and this you will grant is often true.

Let me tell you what was done in a larger high school in a middle western city. A laundry and cleaning establishment offered the school 5 cents a head for every high school boy and girl who went through their plant. The school took it up, sent the pupils in groups, used the money for the athletic association and the trip for material in composition. Perhaps the sedate citizen tax payer will object to this as a waste of school time, but it isn't and if he has a son or a grandson in the school, the boy's interest and acquired knowledge of live industries will soon convert the older man.

Another enlivening method which can be readily tried is that of the Travel Club. Let the class that has been reading Scott, take for their composition work, a trip through the Scott country, including the Trossachs, Edinburgh, Melrose,

Abbotsford and Dryburgh Abbey. Put travel books, Baediker's Guide Books and the like into their hands, and let them do the rest. That they will do it, I have always found to be true; and the teacher will be surprised at the amount of literature, and pictures, postal cards and trophies which will pour in upon her. If the school has a lantern or a postal card projector, you'll find how readily the more reticent children will talk of the pictures shown. Places nearer home can be used; for instance you can imagine a friend is coming to visit you. What places of local interest would you show him and tell him of? In the Travel Club, I would divide the class and work it in squads of 3 or 5.

This system gives one of the best opportunities I know of, to illustrate the combination of exposition and description in oral composition. This will be entirely unconscious at first, and I would not have it otherwise, but after the talks have been given, I would draw out of the class the fact that these types have been combined. That accomplished, pupils will not be staggered at the suggestion for it will be no new thing to them. Moving pictures here will help materially, but the question naturally is, in regard to the Travel Club idea: "Is it feasible" and I would answer "yes." Begin with those who have gone places and others will inevitably want to follow. Perhaps several have been to the State University; if so that will make a worthy start.

In much of this oral work, the laboratory method now so much talked of can be readily used to advantage. Let the class work in squads of 3 to 5. Take one day or two if need be to explain this and start it. The room will be noisy—but it will be orderly noise, and all to some purpose.

Suppose there is a factory in your town that your pupils are going to see; five could work it after something of this manner.

1. General location and why?  
General appearance. (A girl could do this.)
2. General division of the work on various floors.  
(Perhaps a girl again).
3. Features—Machinery equipment etc. (A boy preferably.)
4. Features—Raw material and its progress through the factory.
5. Finished product—how turned out, and where shipped, etc.

The local paper, or the school paper, would no doubt gladly publish the best of these factory trips, all of which would give a worthy stimulus to the work. The commercial club, if there is one, will push such writing and use it to advantage. This might lead up to work in vocational guidance. (See English Journal for October 1912.) In all this work, the teacher must respect the child's confidence *as such*, aiding pupils along chosen lines.

But in all this oral work what about the timid boy or girl who is frightened to stand up and talk? There are such and they must be respected. I would begin on such a one on literature day and after I had had topic recitations from him on the literature, I would show him that he had done what I wanted. Thus I would unconsciously develop in the pupil an ability to talk. Working in squads helps here too, for the pupil is not quite alone, and feels the support of his co-workers.

But the query comes: "Why teach them to talk when they do most of that anyway by themselves." They do, and they should. Then the answer is: "Teach them to talk and to the *point*." In closing, just one last vindication in favor of *oral* composition. He who can talk well and correctly, can invariably write so; that the adverse is not always so, is lamentably true.

As to the matter of economy of time on the part of the teacher. The time to be spent in correction of written work, will be very materially less, as has been made plain by Mr. Clapp. There will be conference periods of course, and galore, but reckoning on six minute conferences with each one of a class of say 180, the sum total of the time spent is an hour to an hour and a half less a week, than the amount of time spent in correction of written themes as figured by the Hopkins Committee. But that is not even half the story. Who that has ever taught composition to even 150 pupils would not rather have more conferences if need be and less written work, than to labor at late hours by an indifferent light, over cold, stale pages of themes and themes. The new system Mr. Clapp outlines has the great advantage, at least, of

having to be done *at school*. It can not be wearily dragged home. And it is working with live clay too—for in conference you get an immediate result—not one delayed till the whole thing is cold, and too often flat, stale and unprofitable. Let me repeat. To all those actively engaged in the work, the actual economy in hours of work saved is less than half the story; the relief in monotony and the substitution of interest in its place is the *real* issue.

### GEOGRAPHY SECTION.

The Geography Section met at 9:00 o'clock Friday morning, Nov. 22, in the Natural History Building, Dr. John L. Rich presiding. The session opened with an excursion through the geographical laboratories of the university and an inspection of methods of storing and displaying illustrative materials conducted by Dr. Rich. After the excursion Mr. Flemin W. Cox of Lawrenceville Township High School gave, under the title, "The Status of Geography Teaching in Illinois," a very carefully prepared report of the results of a questionnaire recently sent out to the geography teachers of the state. A summary of Mr. Cox's report follows:

Over a hundred letters were sent out and forty-two answers were received. Of these, nineteen answers were received from the Chicago schools and twenty-three from the rest of the State. Owing to the organization and environment of the Chicago schools the work must necessarily be different in many respects from that of the other schools of the State. In order that a better idea of the status of geography teaching may be formed, a two-fold summing up of the answers has been made. In one division are the answers from the schools outside of Chicago and in the other are the answers from the Chicago schools. The questions and replies are as follows:

1. In what year of the high school course, does geography come?

*In State* twelve in first year, three in second year, two in first and second years, one in third or fourth year, one in fourth year, four gives no answer.

*In Chicago* nineteen in first year. One school has in addition an advance course.

2. Is it required or elective?

*In State*: nine required, eleven elective, three no answer.

*In Chicago*: five required, thirteen elective, one no answer.

3. Do you teach other subjects? If so, what?

*State*: three answer "no," the remaining twenty answer "yes." The additional subjects taught cover the whole range of high school work except languages.

*Chicago*: two answer "no," the remaining "yes."

4. Is your chief interest in geography or some other subject?

*State*: nine answer geography, five give no answer, one says interest is equal with another subject, nine have chief interest in another subject.

*Chicago*: thirteen answer "yes," two change of interest or equal interest, four another subject.

5. Have you had special training in geography? (Phys. or Com.)

*In State*: three say "no," twenty say "yes." The training ranges from six weeks to two years.

*Chicago*: three answer "no," fifteen answer "yes." Training ranges from six weeks to four years.

6. How long is course in your school?

*In State*: twelve one semester, one a year, three give no answer.

*In Chicago*: seventeen one semester, one a year, and one has one-half first year, and a full year in fourth.

7. Is the work physical, commercial, regional or a combination of two or more?

*State:* seventeen physical, twelve commercial, one teacher's geography, eleven combination, one gives no answer.

*Chicago:* fourteen physical, six commercial, five combination. Many have both physical and commercial.

8. Do you think the course in geography in the grades gives sufficient preparation for high school geography?

*State:* eighteen answer "no," five answer "yes." (Strong emphasis placed on many "noes.")

*Chicago:* ten answer "no," eleven answer "yes," seven give no answer. Following are some characteristic answers to 8:

"Scarcely any knowledge; as, for example I found almost 10% in one year unable to name the continents on a blank world map."

"Not for the sort I would like to teach."

"There is no geography in the 8th grade. What the children had learned is forgotten."

"Not by any means."

"I am forced to assume that my pupils have almost no knowledge of geography and teach accordingly."

"No they try to do too much."

9. Do the pupils show sufficient knowledge of locational geography?

*State:* four answer "yes," fifteen answer "no," four answer nothing.

10. Name the topics which you teach in the order in which you take them. [The object of the question was to try to discover if there is a natural arrangement.] Some answers are as follows:

Many say follow order of text.

Geography of plants, animals and man, when given, came last.

Atmosphere sometimes first and sometimes last.

Earth relation to heavenly bodies, when given, came first

As a whole no definite order could be discovered.

A type of order suggested is as follows: Meteorology, weathering, soils and rocks, rivers, glaciers, shore lines, relief features.

11. Do you have laboratory exercises? How often?

*In State:* three say "no," three say "a few," one "no answer."

*Characteristic answers are:*

"About five or ten."

"Can't tell exactly."

"Yes, every two weeks."

Two say "double period once a week."

Four say "double periods twice a week."

One says "daily" and another from same school says "every day, if the teacher so desires, as we have double periods. The usual practise is a combination of laboratory and recitation."

*Chicago:* all answer "yes."

"Probably half dozen experiments."

"Yes, at no stated time, but it is the backbone of the course and discussion and recitation are based on it."

Five say "one period per week," nine say "two hours per week," one says "three times per week," two say "four times per week."

12. Do the pupils perform the experiment or does the teacher perform them for demonstration?

*In State:* two say "pupils," five say "teacher," five say "both," three give no answer, two say "teacher performs most," two say "pupils perform most."

*In Chicago:* five say "pupils," one says "teacher," fourteen say "both."

*Characteristic answers are:*

"A number are demonstration. Map work individual."

"In some, like humidity, dew point experiments, teacher does reading, pupils make calculations. Barometer reading done by teacher; plotting of curves done by pupils."

"Pupils do work in all but three cases."

"In many cases, the pupils do the work, but in nearly every experiment some one pupil performs the experiment before the class."

"When practical, pupils perform experiments."

"Often a pupil performs the demonstration for class."

"The teacher performs such experiments as the oxygen and carbon dioxide experiments."

"As far as possible, pupils take part in experiments that they may learn how to handle materials."

13. [What apparatus do you use?]

Models are used in only a few schools probably on account of their expense.

Modeling sand and clay are spoken of with disfavor.

Lantern slides are used not a little.

The expense of the lantern and slides is probably the only thing that hinders a wider use.

Maximum and minimum thermometers, rain gauge, wet and dry thermometers, thermograph and barograph are used only by a few.

Many make use of U. S. Geological Survey Maps.

The other apparatus mentioned is taken chiefly from the physics and chemical laboratories.

14. (1) Do you have as complete an equipment for physiography as for other sciences?

*In State:* six say "yes," seventeen say "no."

*In Chicago:* nine say "yes," ten say "no."

*Characteristic answer is:* "Not in cost, but in proportion; all we want."

(2) Please give a list of your experiments that might properly be classed as belonging to other sciences.

*In State:* Carbon dioxide experiment, oxygen experiment, nitrogen experiment, soils, heat, conductivity, air pressure, evaporation, moisture, convection currents, humidity, barometer, thermometer, vapor from plants, magnetic attraction, radiation, composition of atmosphere, condensation of water vapor, expansion of mercury heated, solution, deposition, dew point, artesian well principle, torricelli experiment, hard and soft water, city gas.

*In Chicago:* Effect of heat on solids, barometer, solution, evaporation, study of flame, liquid air, artificial ice, air pump, Holz machine, specific gravity, microscope, humidity, insolation, pressure of atmosphere, expansion of water freezing, oxygen experiment, nitrogen experiment, carbon dioxide, conduction, convection, elements and compounds, acids, boiling point, freezing mixtures.

15. Do your pupils do field work?

*In State:* fourteen say "yes," six say "no," three answer "no."

*In Chicago:* thirteen say "yes," six say "no."

Some specific answers are:

"One field trip."

"Seven per year."

"We do a little."

"Every pupil goes who can raise the carfare."

"Not extensively."

"As often as possible."

"With 50 children of freshmen age, field work is impossible with us. Distance from great number of features forbids such trips."

"Unfortunately not."

"One all day trip every year for all the science classes together."

16. If so, what purpose have you in view?

Typical replies are:

"That the child may see and understand the things he is reading about in books. That they may be more vital to him."

"To illustrate the work studied and to interest the children in their surroundings."

"To clear up points of texts and to make the pupils better observers, thus interesting them in their own regions."

"The purpose of interpretation."

"We base our study of land forms on the field trips. First trip, mantle rock; second, bed rock; third, stream action; a gorge in a rock; fourth, a stream in mantle rock; fifth, slag dump, artificial lava; sixth, glacial topography."

"Make a contour map to show the relation between contours and topography."

"To give pupils knowledge first hand."

"Making concepts and principles real to children."

"Illustrate mantle and bed rock studies, direct observation of the work of streams."

"Show the work of nature in this locality."

"To lead the pupils to see that about which we have been studying."

"To teach the pupils to see."

"Study of a ravine and beach. To have pupils see what they read about and to give them some idea of the magnitude of the work of water. To get them to see meaning and history of topographical forms they are familiar with."

"Partly to illustrate work done in school. Partly to introduce pupils to individual outdoor work."

"To provide the material for concepts by the pupils, to teach the method of observation, reasoning, conclusion."

17. What plan do you follow in conducting your field work?

To this question typical answers were as follows:

"I take class out with definitely prepared outline. Also lecture in the field on special topics as they come up."

"A set of questions placed in the hands of each pupil to outline purpose of trip, and call attention to the land forms to be studied."

"Always illustrating a lesson lecture."

(a) Assignment of points to be observed in field.

(b) Search for these points in field.

(c) Questioning in field for these and additional points.

(d) Assignment of shore problems on the ground.

(e) Class discussion of material and facts gathered on field trips."

"Voluntary trips on Saturdays and after school with special credit allowed."

"The class work leads up to the field work. Each pupil is supplied with an instruction sheet, and he answers the questions in the field. Later, makes copy of field notes."

"Definite places are chosen near the school. The things to be observed are printed and given to pupil; they are required to observe class-room order while making the study. Three of the trips require one-half day, four two-periods."

"Take only a small number of pupils on each trip. Select locations with which pupils are not already familiar."

"First, discuss things to observe, then the trips, the pupils taking notes, then class discussion relating things observed to these discussed by text."

"I go over the ground and select things I wish the pupils to observe, then the class and I discuss examples as we come to them."

For Chicago the answers were:

"Make an all-day trip showing pupils all available material; the same being written up partly as answers to questions and partly as filling out of outline. Written questions to be answered in field. Direct work of volunteers in the field."

"The pupils are generally given an outline of the work covered by each trip with questions to be answered. The report on trip constitutes extra work for which extra credit is given. If the pupil wishes to work up in detail smaller problems he can get credit for such work."

"Outline of points to be seen on trip, a brief lecture on what is to be seen. Make sketches, take notes in some cases. Inattentive pupils are told to write a paper on the trip."

18 and 19. What difficulties are in the way for doing field work? Can you overcome them? If so, how? (These were answered together that the solution of difficulties might be made known in connection with the difficulties.)

*In State:*

- (1) None.
  - (a) Arrangement of schedule, lack of school funds and poverty of many.
  - (b) By going after school hours.
- (2) Keeping class together.
  - (a) Conflict with other classes. Time limited.
  - (b) More time for this subject.

Limitations rather than difficulties.

The work is so well arranged in this school that there are no difficulties in the way of field trips. When we have a four-period trip the pupil is excused from his other recitations. The day after the field trip the class does not recite physiography.

- (a) No opportunity to take whole class.
- (b) No. One teacher has too much work.
- (a) Distance from streams.
- (b) Yes, arrange excursions.
- (a) One one-half year period.
- (b) Don't know.
- (a) Classes too large; always a few whose attention is hard to hold to a definite plan.
- (a) Time. (b) Increase time to one year and laboratory. 80 minute periods.

*In Chicago:*

Too far away. Must do it out of school hours.

- (a) Those growing out of life in a city.
- (b) Getting class off one-half day.
- (b) Making it a picnic.
- (a) District school program.
- (b) Having a science field day for all science pupils.
- (a) Getting to proper localities; rigid programs.
- (b) Partly by taking longer time; convincing the principal.
- (a) Too many arrangements with office of principal and school board.
- (b) By persistence beyond profit.

Many work and have other duties after school and on Saturdays.

- (b) Only with a reluctant principal's co-operation.
- (a) My principal approves of the work. In three classes all but five pupils went on the trip this year.
- (a) The trips cannot be taken by pupils who are employed. Many could not attend school if they did not earn all or part of their expenses.
- (b) By crowding the first trip full of interest and then getting them to do individual outdoor work, presenting reports, photographs or sketches for extra credit. If the reports are good, I visit the place and get photographs.

20. Do you find the text-books and laboratory manuals satisfactory? If not, what are some of the chief objections?

*In State:* five say "yes," five say "no," three no answer.

*Characteristic answers:*

"Some texts are not scientifically correct because they have not kept pace with late discoveries."

"Few manuals are. Texts usually are."

"The text books are too difficult for first year pupils. The manuals cover one year's work instead of one semester."

*In Chicago:* thirteen say "no," five say "yes," one no answer.

*Characteristic replies:*

"No half year book."

"Texts are good."

"Only fairly. Text written from college point of view."

"Satisfied with manual not with text on account of its lack of illustrations, poor arrangement and lack of comprehensiveness."

21. What reference work do you assign?

*In State; typical replies:*

"Not much."

"Assign no reference work. Draw attention to other books on the subject, such as Salisbury's physiography; magazines; Gilbert, Tarr, Davis and Scott; publications of the U. S. Department of Geology and Agriculture, magazines and general publications."

*In Chicago; typical replies:*

"I do not assign reference work, but keep a good deal of reference material on my desk, and loan it to the pupils recommending certain portions."

"Very little. No time."

"Worlds Work, Outlook, National Geographic Magazine, Clippings, magazine articles, year book of Department of Agriculture; reports on up-to-date topics as we need them."

"Topics such as Mining Gold, Some Great Coastal Hurricane, Vesuvius, the San Francisco Earthquake, Cause of Wreck of Titanic."

"Some stronger pupils have read in Chamberlain's and Salisbury's *Processes and their Results*."

"Reference to about a dozen high school texts on topics connected with glacial work."

22. Would you like to have a list of reference and illustrative books and articles made out by the teachers of Illinois?

*In State:* sixteen answer "yes," seven give no answer.

*In Chicago:* twelve answer "yes," one answers "no," three give no answer.

Following is a list of titles suggested:

Illinois Geog. Survey Bulletin No. 13.

National Geog. Magazine.

Technical World and other magazines.

Stories of Mother Earth.

Land of the Long Night.

Lolamai, the Cliff Dweller.

Fairbank's Rocks and Minerals.

Starland.

Railroad maps and guides.

Triumphs in Science.

Journey through Switzerland.

U. S. Geog. Survey Bulletin.

Professional and Water Supply papers.

Salisbury's Geology and Physiography.

Chamberlain and Salisbury's Geology Vol. 3.

Russell's "Glaciers of N. A."

Russell's "Rivers of N. A."

Amer. B. C. Monographs on U. S. Physiography.

Mills' "Realm of Nature."

Gray's "Nature's Miracles."

International Geography.

Shaler and Russell's Books.

Huxley's six lectures on the "Origin of the Species."

Geikie's "Primer of Geology."

Dodges' "Reader in Physiography."

Harrington "About the Weather."

Man and his Work.

"Soil," by King.

"Weathering of Rocks," by Merrill.

Grammar School Geography.

23. Do the pupils like the subject? What part seems least interesting?

What part seems most interesting?

*In the State:* twelve answer "yes," two answer "no," four give no answer.

*Chicago:* ten answer "yes," two answer "no," three give no answer.

[The topics given as least and most interesting do not indicate any marked unanimity.]

24. What, in your estimation, are improvements most needed to increase the efficiency of geography in your school?

*In the State:* four give no answer. Almost all ask for more apparatus, books and time.

*Chicago:* [Answers similar to those for state.]

25. Why is physical geography valuable as a high school subject?

*In the State:* six give no answer.

1. It explains some of the physical phenomenon which have vexed the student, makes him more observant of nature, prepares him for advanced study in science, teaches him to be more accurate in laboratory work, and creates interest in relation of man to land in his life work.

2. It brings pupils into more direct contact with his general physical environment than almost any other subject and teaches him the meaning of that environment.

3. Because the subject makes it necessary for a pupil to do his own thinking. He must seek for cause and effect. He can never again be wholly unmindful of the changes going on about him.

4. It furnishes the back-ground for an understanding of many economical and historical questions.

5. Should provide the student with the means of determining for himself the advantages and disadvantages of a given area or location to the home seeker, business man or traveler.

*Chicago:* three give no answer.

1. It enables a pupil to find himself as to his future aptitude for science, and incidentally increases habits for observation.

2. It interprets physiographic features. It gives a better opportunity than most subjects to present a subject with the *supplementary aid* of books, instead of presenting subject from the book alone.

3. It brings the pupil into touch with so many things that are valuable. It broadens his outlook on life. It makes it possible for him to understand and be interested in many things in magazines and newspapers.

4. Under existing conditions, less valuable than physiology and chemistry. More valuable than physics, botany or zoology.

5. More opportunity for research work. Lead to inquiry concerning other sciences.

26. What do you think of physical geography as a core for general science? [The replies show no very definite thought.]

27. a. Do you believe in introducing more of the human element?

*In State:* twelve say "yes," one says "no," ten no answer.

*In Chicago:* fourteen say "yes," two say "no," one no answer. Introduce it with every subject.

b. Suggestion for human element. Replies were as follows:

(1) I. Influence of physiographic conditions upon:

- (a) Means of settlement of a region;
- (b) Occupation and industries of people;
- (c) Habits and traits and character of people.

II. Physiographic control of man.

III. Man's control and alteration of physiographic conditions.

IV. Regional and place geography.

(2) We have found that pictures are a great aid in the study of any region. At present, we are making a collection of pictures for the human side of the work. We are mounting the pictures on gray cardboard 24"x36", and we propose to have a series of questions for each set of pictures. In the Mississippi study, we have a group of pictures of cotton in the field, at the compress, on the levee at Memphis and on the river boats.

(3) Few texts have anything worth while on soil. I consider it an important topic. Economic geography woven into the text in its proper place and not in two or three chapters at the end of book.

(4) I would introduce:

1. All subjects pertaining to the local regions that were in any way influenced by the physiographic conditions as mines, brick factories, roads, local sur-

veys, nearby streams, study of soil and its relation to agriculture (not from standpoint of botany,) study of nearby springs, plants which furnished water for city use.

## 2. Rainfall and vegetation.

(5) The relation of topography to the establishment and growth of cities, seaports, lakeports, etc. Soil products and mining industries.

(6) The geographic influence of history and social progress, i.e., waterways, mountains, coastal plains, water gaps.

(7) Relation of climatic influence on crops.

(8) I think that physical and commercial geography should be not separate subjects, but combined so as to go hand in hand through a full year's course with physical geography as the basis and the human relations as illustrative material to live up what to the average pupil is otherwise a very dry and often much disliked subject.

(9) In connection with rivers and soils I think it is wise to give an idea of present day problems in regard to the need for preservation of forests and soils, etc. Also to introduce some material in regard to irrigation problems of the West, and the drainage of swamp lands in the East; also to emphasize the importance of regular flow of streams and the making of important inland water routes.

(10) Density of population with regards to geographic conditions.

(11) Location of railroad with regard to geographic conditions.

(12) Location of leading industries of state.

(13) In place of much indoor work (exercise and reading) I would make optional with the pupil, individual outdoor work, to be made evident to teacher, by sketches or photographs and written or oral reports.

(14) A list of optional outdoor exercises presented during one semester at one school:

(a) Action of "frost" on sidewalks, walls, etc.

(b) Action of rain on exposed slopes, embankments, clay dumps, etc.

(c) Action of running water carrying loose materials and depositing it in deltas. Erosions of clay cliffs by streams. Erosions of bed rock by small streams.

(d) Effects of dunes on forests.

(e) Glacial moraine.

## Summary.

It is taught in almost all high schools and is required in about half of them. The inquiry into its status is timely. Almost all teach physical geography and a few have additional courses in commercial or economic, and a few teach a combination of two or more. Discussion of subject must consider physical geography as a first year study. Seventy-five per cent report that the course is one semester. (A question arising is: "Shall we strive to make the course one semester or two?") There is no definite order of subjects followed. (Is there a best order of subjects?) The preparation in the grades is not adequate, being very deficient in locational geography.

The subject is not in the hands of its friends. The majority of those who answer state that their chief interest is in some other subject. Undoubtedly of those who did not answer a larger majority have their chief interest in another subject. It is usually taught by teachers who teach other subjects. Almost every other subject in the curriculum is taught by the geography teachers. It is taught more frequently by science teachers, but often by the teacher that has an extra vacant period. The training of the teachers varies from nothing to four years. The questionnaire does not reveal whether they had had other science training or not.

There are strong advocates for individual laboratory work by pupils and equally as strong for demonstrational work done by pupils. Not a few believe in part of one kind and part of the other. Many do not have laboratory work. The subject has not received the recognition as a science that has been given to other sciences. Some have a little and a few have two double periods a week. There is no agreement as to what experiments should be performed. The lists reported would make a

confused jumble of general science. The apparatus used was as varied as the experiments. They likewise show the wideness of the field and the wealth of material for laboratory work.

The equipment for physical geography is very limited. Almost all believe in field work. As in regard to laboratory work the answers show that a lack of definiteness, both in what should be done and how to do it. (A question to be worked out.) There are some real difficulties in the way, but outside of Chicago, they may be overcome. Text-books and laboratory manuals are not satisfactory. (This question was sent out before Professor Dryer's new book came out.) The reference work is as varied as the field work, and laboratory work. Much of it is impossible for the 9th year pupil. (Is there time for much reference work?)

It is an interesting subject. Every part is found interesting by some. The subject of meteorology is found to be dry by some and the most interesting by others. Many good reasons justify physical geography as a high school subject. It is ranked high in comparison with the sciences. The idea of general science is generally disliked, but physical geography offers a good core for subject. There is a strong demand for a new geography that introduces more of the human element. It should be woven into the text, not added as a few chapters at the end. Geography should be one subject, not three, physical, commercial and economic.

This report was formally discussed by J. M. Large of Joliet, who spoke as follows:

"The present course in physiography is a direct growth from the course established ten or twelve years ago. The departure of teachers and the coming of new ones has not caused radical changes in the course, with all the attendant loss in material gained during the teacher's period of service which sudden and radical changes involve. Gradually the subject matter has been changing from the study of striking or spectacular features to a study emphasizing the effect of physiographic conditions on human life relations. For example: how the surface effects methods of transportation and communication. Why in one kind of region there is a prosperous and advancing agricultural population while in another the people are poor and unprogressive. The study of the physiographic material is retained but the emphasis is different.

To secure uniformity of work mimeographed sheets of questions for each study have been prepared and the proper one is given to each pupil when he takes up a new study. The material in each question sheet is one of the principal subjects of discussion in the departmental teachers' meetings. These discussions and the resulting revisions are most useful in keeping the course up to date. The use of the question sheets makes it possible for a beginning teacher or a teacher coming from a school where a different idea of physiography is held to do passable work from the start. It also makes the course more flexible than it would be if the pupils' work were based on a printed laboratory manual, because a study can be revised at any time a revision seems necessary without having to wait for a revision of the manual. The question sheet is not a

guide to be slavishly followed and the teacher is not deprived of the chance to show her resourcefulness.

The course is based on observation in the field and in the laboratory as far as possible instead of on recitations from text and reference books. The pupil studies real things at first hand when the thing can be visited in the field or when it can be brought into the laboratory. Definition and classification work is reduced to the minimum. Other branches of study more properly take care of these phases of study.

After a subject has been studied the pupil is required to write up in class that which he has learned and usually he is compelled to learn more in order to write up what is required by his question sheet. This department is not original in requiring careful written work. I believe it is required in nearly all language work, in much of the mathematics and English work, in the commercial courses, and in all the sciences. Written work makes it possible for the teacher to judge more fairly the quality of a pupil's thinking than he is able to do when the recitation method is followed, simply because he is able to get from the written work a large part of *each pupil's* thought on the subject in hand and to follow his thought consecutively. By the recitation method the teacher gets only a fragment of each pupil's thought, and a different fragment from each pupil. I am now teaching classes by each method and have been for several years and get far better results from the first. Besides this, written work makes it possible for a pupil of lower mental caliber or a pupil of slower thought to do fair work, while in recitation work the pupil of the same grade of intellect is not alert enough to keep up and either fails at the end of the semester or is passed by the grace of the teacher. The brilliant and the quick thinking pupils may do fairly well in recitation work.

The work in physiography. In the fall the pupil begins his work by going on field trips to study some of the materials making up the earth's surface. All his life he has been walking, playing, or working on and in this material but to him it is nothing but dirt. He is taught on the field trips that it is something more. In the laboratory at about the same time he learns something of the composition of the air, especially of oxygen and carbon dioxide, on account of the part they have in rock weathering. Next he studies in the field the action of streams on the materials he studied at first. A stream making a gorge in bed rock and one making a cut in mantle rock are visited. The knowledge gained on these field trips enables him to understand, later on the work of the Mississippi and of other streams. About the middle of the year, when

studying volcanoes, a visit is made to the place where the slag from the steel mills is dumped. As this is really an artificial lava running down the slope before his eyes, he gets some ideas from this trip that the text and his imagination could hardly supply. Later on, in the spring a trip is made to study glacial material in this vicinity.

When the first four field trips are finished, the student learns how to use the contour maps made by the U. S. Geological Survey and is thereby enabled to extend the knowledge of land forms which he gained on the field trips to distant regions. A part of this work is purely physiographic but the effects of physiographic conditions on human life relations is also studied. For example a study is made of an area in the Red River Valley as an example of topographic youth or infancy. After the purely physiographic study is finished, the relation of the flatness of the surface and the fertility of the soil to the great wheat industry and to the prosperity and progressive condition of the people are brought out. As a contrast they study a region topographically mature. Here the former plateau has been reduced by long continued action of the streams to a succession of narrow valleys and ridges. Communication and transportation are necessarily difficult and the soil poor. As a result, the people in wealth and progressiveness are quite the reverse of those in the first area mentioned except where they depend on minerals or on manufacturing. These regions are typical of large surrounding areas, and their study furnishes a basis for understanding the geography of our country. Other studies which can not be mentioned on account of lack of time are of areas typical of other extensive regions.

About November or December the pupil temporarily stops studying land forms and takes up the study of the atmosphere, chiefly because at this time nature is furnishing a lot of variations in atmospheric conditions. Before beginning the real study of the atmosphere, a study is made of air pressure and temperature and the instruments used in their measurement. Then the conditions which control temperature and rainfall are studied and as a summing up, a study of the government weather map is made. After completing the studies of weather and climate, a more advanced study of land forms including mountains, volcanoes, coast plains, glaciation, etc. It ought to be mentioned that there is a study of reclamation of swamplands, and an oral and map study of irrigation and, in connection with the study of the Mississippi River, the deep waterway problem and the problem of prevention of floods is studied. There is also a study of Joliet's water supply for domestic purposes, with the attendant questions of prevention of typhoid fever.

Each student who is to become a farmer or gardener or the one who expects only to care for a city lot or a flower bed can get training material of value from the study of the materials of the earth. Those who expect to become civil engineers or contractors can get material of value to them concerning work with excavations, hills, bridges, etc, from the same studies and from the studies of stream action.

The miner, the mine operator, the mining engineer, and well driller should know as much as possible concerning the material with which he works. The investor in real estate, manufacturing, transportation, and other enterprises can obtain much information of value to him from the study of surface, soils, streams, temperature, rainfall, and other conditions. In fact everyone engaged in an industry that depends on the soil or is influenced by surface or climatic conditions will be benefitted by this study. The prospective student of chemistry will have some of his troubles made a little easier by the studies of carbon dioxide and oxygen. The prospective student of physics by the study of thermometers, barometers, etc. The student of domestic science by all of these and in addition by the water supply, and ventilation studies and reports on commercial geography and elementary science."

The report was further discussed by Prof. C. W. Rolfe of the University who called particular attention to the lack of definiteness of purpose in geography teaching revealed by the report; by Miss Baber of Chicago University who emphasized the educational value of geography because it furnished unlimited opportunity for the organization of first hand material; by D. C. Ridgley of Normal who pointed out the advantages of field work in arousing interest in the subject; by Miss Vinnie B. Clark of Oak Park, J. H. Smith of Austin High School, Chicago, F. W. Cox and others.

### *Afternoon Session.*

The afternoon session was opened by an address by Prof. Charles R. Dryer of Indiana State Normal School, Terre Haute, Ind., on the subject, "The New Departure in Geography." Professor Dryer's address follows:

"The history of the development of secondary school geography in the United States during the past century, may be divided into five or six stages, each characterized by some dominant idea.

1. *The Gazetteer Stage.* This kind of geography, dating from the time of Strabo, consisted of a description of the earth, giving statistics of location, area, population, government, products and social conditions of countries, states and cities. Only the great natural features were mentioned, such as mountains, rivers and arms of the sea. The only scientific part was astronomical and involved "the

use of the globes." Globes properly made and mounted, were used to demonstrate and solve a large number of mathematical problems in astronomy, geodesy and navigation. This has survived to our own day under the name of mathematical geography. The books of Morse and Parish (1812) are typical specimens, and are still not without interest for the geographer. About the middle of the last century, they were displaced by something more palatable and

2. *The Wonder Book Stage* came in. Here my own personal experience begins. I have forgotten the title and author of my first physical geography, and I would now give a good price for a copy. Perhaps it was Colton's (1867), Warren's (1863), Mitchell's or Montieth's. It contained descriptions of the more unusual, interesting and spectacular phenomena of the earth, such as volcanoes, earthquakes, geysers, cataracts, caverns, coral islands, salt lakes, icebergs, glaciers, ocean currents and waves, the will-o'-the-wisp, St. Elmo's fire, deserts, forests, and remarkable animals and races of mankind. The appeal was largely to the sense of wonder and awe. There was little or no attempt at scientific explanation, but frequent references to the power, wisdom and goodness of the Creator. The general tone was as pious as that of Sir John Maundeville's Travels, which it resembled in uncritical and credulous spirit. It seemed designed as much for religious as for scientific edification. The book was intensely interesting and gave students their first glimpse into the world of nature. Anybody could teach it and everybody liked it. Those were halcyon days for physical geography.

About 1873, the classic work of Guyot appeared and ushered in,

3. *The Natural Teleology Stage*. While the subject matter remained much the same as in the Wonder Book, it was organized and lifted to a high plane of teleological philosophy. It was enriched by the great generalizations of Humboldt on the origin of mountain ranges and the relations of vegetation to climate and by the studies of Agassiz and others on the Alpine glaciers. Orographic, isothermal and plant zone maps and profiles demonstrating the primal geographic relations of relief, climate and life appeared. The plan of creation by which the round world, with its continents and oceans, its great features, its plants and animals, had all been brought into existence, especially and solely as a congenial home for a variety of men, was the great theme. It was a development on the geographic side of Paley's argument from design, and was pushed to its ultimate and foregone conclusions. "The continents are made for human societies, as the body is made for the soul." Guyot writes: "The conclusion is irresistible, that the entire globe is a grand organism, every feature of which is the outgrowth of a definite plan of the all-wise Creator for the education of the human family, and the manifestation of his own glory."

Nearly all of the great generalizations which he taught so brilliantly and confidently, have gone the way of his laws of relief and mountains by fracture. He was not in possession of sufficient facts and the facts he had, were manipulated to fit into an artificial system.

It has happened more than once in the history of human thought, that the epoch, when men believe that they have attained final and absolute truth, is immediately followed by some discovery which upsets their conclusions and destroys their systems. It was Guyot's tragic fate to live long after the imposing structure of his science and philosophy was shown to be a castle in the air, and yet never to see that the doctrine of evolution had dissolved its foundations. His style was formal, stiff and grandiose, and produced in the student's mind, the impression that physical geography deals only with the remote, and has nothing to do with the familiar land and sky at home. Yet, by the introduction of European ideas and methods, by his broad view of the nature and scope of geography, and not least by the compilation and publication of a magnificent series of relief wall maps, Guyot contributed as much as any other one man to the advancement of geography in America.

The new learning and the new doctrines soon found its embodiment in text books which ushered in

4. *The General Physiography Stage*, using that over-burdened word in its etymological sense of a general description of nature. In 1869, Huxley delivered in London, a course of lectures which were published in 1877, under the title of *Physiography*. He reversed the usual order, and began at home for Londoners with the Thames basin, thence branching out to rain, snow, ice, air, rivers, the sea,

earthquakes, volcanoes, coral islands, the geological structure of the Thames basin, distribution of land and water, figure and movements of the earth, ending with the sun. Thus Huxley became the father of modern physiography.

This movement was not strongly under way in this country until the publication, in 1888, of Hinman's *Eclectic Physical Geography*, one of the most remarkable text-books with which I am acquainted. Rigidly scientific, even technical, in organization and method, it began with a chapter of elementary physics, and dealt in logical order with planet, atmosphere, sea, land and life. The author availed himself of the then unpublished researches of Abbe, Dutton and others, and succeeded in making a book in many respects ten years ahead of its time. It knew nothing of the base level of erosion or the geographic cycle, but with these exceptions, presented clearly all the great processes of land sculpture found in the books of today. In the chapters on life, he presented boldly, and for the first time to American high school students, the doctrines of Darwin and Huxley, heredity, variation, adaptation, environment, selection, evolution. In the chapter on man, he took the bull by the horns, and his life in his hands, as he, himself, expressed it to me, and showed by a wealth of argument and illustration, the affinity of man with the apes, and his probable descent from ape-like ancestors. The book was a great success, and was foremost in the field for ten years. One might do much worse than to use it now. I want to take this opportunity to offer my tribute of admiration for the courage and ability of one of the brightest men I have ever known, Russell Hinman, whose untimely death last spring, came to me as a grievous personal loss.

Hinman's book was matched in England, in 1891, by Dr. Mill's *Realm of Nature*, which, for breadth of knowledge and vigor and charm of style, still remains a model. In scientific method, physics, astronomy, geology, biology and anthropology, it is more inclusive and stiffer than Hinman, and for the teacher is one of the best introductions to physiography or, as Mill defines it, the science of all creation.

5. *The Specialized Physiography Stage* differed from all the others in that its inauguration was formal and official. This was the publication in 1894, of the report of the Conference on Geography to the Committee of Ten of the National Education Association. The Conference consisted of eight progressives, and one stand-patter, who presented a minority report contesting nearly every recommendation of the majority. Of the eight progressives, four were eminent geologists. The field work of Powell, Gilbert, Dutton, Russell, and others upon the arid western plateaus, had furnished the material for a new science of land forms, based upon rock structure and sculpture, such as could be found only in America. Davis, by the use of these materials, supplemented by his own field studies in the Appalachians, and by his illuminating conception of the physiographic cycle, developed geomorphology to a degree of perfection comparable to that of meteorology and oceanography, and had been teaching it at Harvard under the name of physiography for ten years. The Conference report gave this science its proper place as co-equal with the other members of the physical-geographical group, and it seemed the more prominent because it was new. In the emphasis laid upon land forms, scientific explanation and field and laboratory work, the report of the Conference was revolutionary.

The first text-book embodying the new ideas, was Tarr's *Elementary Physical Geography* published in 1895. While retaining much of the old material, half the book was distinctly geological. The animus and initiative of the movement in the schools were distinctly due to Davis, whose pupil Tarr had been, and most of the books since published, may be characterized as belonging to the Davis type. All others soon became out of date. In 1898, appeared the book of Davis and Snyder, which carried the geomorphological phase to its extremes, introducing many details and refinements of the new and fascinating science. The texts of Dryer in 1901, of Gilbert and Brigham in 1902, and second books from Tarr and Davis, left little to be desired in the way of text-books of this type. The most momentous thing about them, was that physical geography ceased to be a merely informational subject, and made strong claims for a place alongside of physics, chemistry, and biology, as a subject for laboratory and field work involving scientific discipline. This claim was received by teachers of other sciences with scepticism, if not hostility.

Dr. John M. Coulter, writing in the *School Review* for February, 1896, on the "Correlation of Science Studies in Secondary Schools," said: "There are those whose purpose and method are purely informational, subjects about which it is well enough that every intelligent man should be somewhat informed. Physical geography, astronomy, geology, physiology so-called, as mostly taught, all belong to this category, and are not included in the college demand for scientific training. They are necessary and exceedingly helpful subjects, but in the very nature of things, cannot be handled in secondary schools other than as purely informational subjects. As such they contain no scientific training whatever, and such claim should not be made for them."

The gauntlet thus thrown down, was taken up by Davis in the March number of the same Journal, and the possibilities of physical geography for scientific training were vigorously defended. Coulter's views were attributed to excusable ignorance and his positive assertion of them pronounced regrettable. To the same Journal, in 1896-7, Tarr contributed an article on the "Teacher's Outfit in Physical Geography," designed as a guide to the selection and use of laboratory and library material, and another on "Field Work in Geology and Physical Geography," based upon excursions around Ithaca, one of the richest fields in the world.

In the same years, Brigham published in the *Popular Science Monthly*, a paper on the "New Geography," maintaining that geomorphology, based upon the central principle of the base level of erosion, underlies the whole subject of geography, modifying or controlling climate, organic distribution and the history of man, and in an article in the *School Review* made strong, and unstinted claims for physical geography in the high school. In a contemporaneous paper,<sup>1</sup> Dryer argued at length, that the new geography is scientific and rational, that it has been enriched by the addition of geomorphology, making it preponderantly a natural science, and that therefore, it must adopt the scientific or laboratory methods of study and teaching. "Thus the new geography becomes able to give not only information, but scientific training; the ability to discover facts and to see their relations. It takes geography out of the list of memory or useful knowledge studies, and plants it in the quickening current of modern scientific thought."

You all know the rest of the story. Text-books and laboratory manuals of physical geography multiplied, culminating in the monumental *Physiography* of Salisbury and the *Manuals* of Davis and of Tarr. All of them have been, and still are, widely used. The new geography was an overwhelming success, and has held the field for fifteen years. It is true that the percentage of students in geography has declined since 1896, but not so much as in physics, chemistry or botany.

Specialized physiography holds the field today, but its position is no longer undisputed. As early as eight years ago, doubts began to be whispered around as to whether it was really suitable for the average high school. The high school freshman was said to be too immature and too unfamiliar with even the elements of the sciences involved in an understanding of physiography. To do it justice, required a much larger outlay for space, time and material than any, but the strongest schools could command. Competent teachers were very scarce indeed, and in the hands of one without special preparation, the work degenerated into superficial and confusing text-book study, without maps, pictures or apparatus, of little value for exact information and of none at all for scientific discipline. The doubters and objectors were little heeded, and were generally overwhelmed by the enthusiasm and commanding influence of the leaders, who were mostly university professors. I have preached pure physical geography as a sort of gospel—the science of the natural earth as it would be if no human being had ever lived upon it. I have advocated and defended it on every occasion to the best of my ability for thirty years. The burden of my propaganda, has been that it is the open door to all the sciences, that there is nothing so good for getting young people's eyes open, and for awakening an interest in nature. There is no net that will land so large a haul of scientific converts. Whether I have made a good fight or not, I have kept the faith and hold it still. Yet I believe that the sceptics were and are more than half right, and that the kind of physical geography I have stood for is in most schools impossible, and will remain so for a long time to come.

<sup>1</sup>*Inland Educator*, IV, 1, *Studies in Indiana Geography*, 9-15.

My confidence was first shaken at the High School Conference on Geography held in this place four years ago, when I realized that there was a general demand among good teachers for something different; just what, they hardly knew. They seemed to agree upon only one thing, that geography must be humanized and brought closer to the life of the common people. It was here that my eyes were opened, and I caught my first vision of a newer geography, which might be more available, more attractive, and more valuable to the great mass of students who are to be educated, not for the university, but for better citizenship.

However personal opinion may differ, a new departure in geography, a formidable revolt against the old regime is not only imminent, but is already here. The contention of Dr. Coulter and others that physical geography is less available than other sciences for scientific training has been sustained by the experience of unnumbered teachers. As I have argued at length elsewhere,<sup>1</sup> geography is at a disadvantage as a laboratory science because its real laboratory is out of doors. In physics and chemistry, all the material may be placed on the student's desk. In botany and zoology, such material is almost unlimited, it being necessary for the student to go into the field for only certain special lines of work. In physical geography, the student in the laboratory can be brought up against but a small portion of the phenomena to be studied, mostly those pertaining to the atmosphere and weather. A valley or a delta made in a 3x6 tank is a poor substitute for the work of a real stream. Mountains and plateaus built upon a moulding table, or shown on a model, are caricatures of the real things. All map work, however good and valuable in itself, is work with highly conventionalized and artificial representations of things, a training in the use of a specialized language rather than in a scientific observation. The best field work which can be hoped for, can bring the student in contact with only a small portion of the materials of geography. We dwellers on the interior plain, are all land lubbers, and at home realize little of waves, tides, currents and shore forms. Only by a long journey can we be brought to any but a vague sense of mountains, volcanoes, geysers, glaciers or canyons. The organization and program of most schools absolutely prevent the use of even the limited field available. Not one teacher in ten can, if he or she would, take a class out for systematic and continued field work. In many localities there is absolutely nothing to be seen on the face of the land within ten or more miles, but a featureless plain. Are not the difficulties in the way of accomplishing much by field work for the average school practically insuperable?

Salisbury<sup>2</sup> and others maintain truly that better teachers and laboratories, and wiser school boards, superintendents and principals can do much to remedy the unfavorable conditions. But can we reasonably look for a general revolution in this or the next generation? We may and should work toward our highest ideals, a geographical millenium when school appropriations shall be made to cover all the expense of taking classes out into the field as liberally as they now are for bringing the material of physics, chemistry and biology into the laboratory, but is it not a rather forlorn hope? It seems to me that the contention that physical geography is available in schools to give scientific training in the same sense and degree as physics, chemistry and botany must be abandoned.

In turning away from the specialized physiography stage, many roads are open for the advancement of a better geography in the schools. All of them lead in the direction of biogeography, or the relations of living creatures to their natural environment.

6. *The Biogeography Stage*, like its predecessor, was officially inaugurated, and its initiative is again due to Prof. Davis, the father and sponsor of specialized physiography in the schools. His vice-presidential address at the St. Louis meeting of the A. A. A. S. in 1904, was a brief plea for the organization of what he ventured to call ontography, or the life phase of geography, for geography defined as a study of physical controls and organic responses, a definition which he subsequently elaborated with characteristic fulness and force,<sup>3</sup> and which has been very generally accepted

<sup>1</sup>Journal of Geography, X, 1.

<sup>2</sup>Journal of Geography, IX, 57.

<sup>3</sup>Geographical Journal, XX, 413.

American Philosophical Society Proceedings, XL1., 235, National Society for the Scientific Study of Education, First Year Book, Part II.

in this country. Like all similar movements, this involves advance along many lines.

*First.* Progress involves the elimination from geography of pure physics, astronomy, geology, history and all matter which is not essential for the solution of the main problem. There is at present, a tendency in some localities, to revert to an earlier stage, and to use geography as a name for an introduction to general science. The stronghold of this movement is in the state of New York, where the Regents' Syllabus and examinations force upon the schools a geography of this type, for which the recent text-book of Arcy and his colleagues was specially written. This seems to me a distance step backwards and I cannot believe that it will prevail.

*Second.* The forward movement involves a rigorous sifting of geomorphology and meteorology down to what is essential as a basis for biogeography. Many topics and details of great interest to physiography in the university must be omitted or briefly treated. Mention of even the names of planets and of geological eras and periods, terrestrial magnetism, the nebular and meteoric hypotheses, eclipses, electrical and optical phenomena, the theory of the tides and special studies of minerals and rocks may be eliminated. Volcanoes, geysers, earthquakes, caverns, coral islands, the fancy stock in trade of the old geographical wonder book, may be briefly treated. Multiplied species of rivers and lakes and many refinements of classification and of the phenomena of the physiographic cycle may be safely omitted. Extended discussion of ocean temperatures and salinity and of deep sea deposits can be dispensed with. Coasts, harbors and currents are more important than the theory of the tides. The chapters on the atmosphere are to contain as little meteorology, and as much climatology as possible.

*Third.* Modern research shows that climate is a much more important factor than relief in determining the distribution and association of plants, animals and men. Geomorphology must make way for climatology, the keystone of the geographic arch.

*Fourth.* The development of plant ecology, made familiar by Schimper, Warming, Cowles, Clements and others, has opened a new world in what Schimper frankly calls plant geography. Ecology, as defined by Haeckel, is "the science treating of the reciprocal relations of organisms and the external world," and biogeography, the ontography of Davis, is nothing, but universal ecology. Some field and class work now done in geomorphology might be profitably replaced by work in plant ecology, as being more distinctly geographical and as furnishing a better introduction to the study of human relations.

The vegetative covering of the earth, a true phytosphere with some holes in it, forms a concrete expression of the structure and relief of the earth crust, of climate, and of the efficiency of solar energy, "a visible synthesis of the climatic and edaphic elements." A single map of plant regions tells more about actual climate than a series of temperature and rainfall maps. Vegetation forms the basis on which animal and human life subsists, and has more to do with economic geography than any other natural factor. With an adequate preparation in climatology and plant geography, the way is clear as never before for the development of the culminating phase of our science, human geography.

*Fifth.* The demand of a commercial and industrial age and people for something which will help more directly in the business of making a living or a fortune may be rationally met. The rubble heap of commercial geography, hitherto a collection of facts and figures, which largely cease to be true before they can be printed, and fortunately must be forgotten as soon as learned, may be transformed into a science of economic geography, a study of natural resources and the ways in which men have utilized them to get various kinds of a living, and may utilize them to get a better living. This is the plane along which geography touches the masses of men most closely, and can do most to promote better citizenship and a higher civilization. A geography which is generalized ecology must be in the broadest sense, economic.

*Sixth.* There is still a higher phase of geography in which much can be accomplished, the scientific study of environments in the relations they bear to all the activities of human life, economic, social, political, esthetic and religious. This

means a notable development of regional geography and, as I have shown elsewhere,<sup>1</sup> on the basis of natural rather than political divisions. It means also the use of a greatly extended variety of charts and maps, specimens of which are shown upon the wall by Mr. Clem. The dream of Ritter, Guyot, Buckle and Ratzel, may be realized, and it may be possible to show the relations of human life to natural environments in a manner so clear and convincing that no economist, sociologist, historian or statesman will dare to ignore the geographic foundation of his science. The result may be a higher and broader teleology which shall show that our highest ideals are realizable on this planet and how the earth may become the home of men as far beyond us as we are beyond the cave dwellers.

To awake from our dream of the geography of the future and come back to the practical affairs of the present. The first steps toward a newer and better geography in the schools have already been taken. Officially inaugurated by Davis, in his St. Louis address, the movement has gone on at such a rate as to show that it is not a temporary and transient phenomenon. It has been materially helped by the reports of the committees of the National Education Association and the Association of American Geographers.<sup>2</sup> The two reports agree in recommending the omission of extraneous matter, the abbreviation of many topics hitherto found in current texts, in the expansion of many others more closely related to human life, and the introduction of a considerable amount of the economic and regional geography, in one case of the United States and in the other of the principal countries of the world. They mark a decided step forward toward humanization.<sup>3</sup>

The forerunner among books was the little volume of Prof. and Mrs. Herbertson, *Man and His Work*, published in 1902, which has had a rather wide distribution in this country and should be on the desk of every teacher. The pioneers of the newer geography have been British rather than American. Mr. Mackinder, by his brilliant lectures at the Universities of Oxford and London, by his occasional articles, and by his masterly book, *Britain and the British Seas*, has been an inspiration to thousands toward the attainment of that point of view which he calls geographic. Now as a member of Parliament, high in the councils of the nation, he is a potent influence in the administration of the greatest empire on earth. Dr. Herbertson, by his teaching at Oxford, by the organization and direction of the Geographic Association, by his numerous books and perhaps more by his series of wall maps, is leavening the dull and bureau-ridden schools of Great Britain with new geographic life, and making unique contributions to sound views and methods throughout the English speaking world. Do you all know that, thanks to Dr. Herbertson, you can now buy a set of Oxford wall maps for the world and for each continent, showing physical features, structure and soils, thermal regions, pressure and winds, rainfall, vegetation, natural and economic regions, and political divisions? Miss Semple has crowned the labors of a learned life by her monumental work on *The Influences of Geographic Environment*. From Prof. Brunhes of Fribourg, comes *La Géographie Humaine*, a volume of 800 lucid and charming pages, which, it is to be hoped, somebody will translate into English. These two books are epoch making in that they are the first since the days of Ritter and Ratzel to present human geography in a systematic and masterful way. Among the text-books belonging to new species, are the *Physical and Commercial Geography* of Gregory, Keller and Bishop, or for short the "Yale Geography," the *General and Regional Geography* of Unstead and Taylor, one of the first fruits of the Oxford School, *The Elements of Geography* by Salisbury, Barrows and Tower, or the "*Chicago Geography*" and to descend a little nearer to the high school freshman, Dryer's *High School Geography*. Others will probably appear in the near future. The texts of the new types are necessarily tentative adaptations, and no one can say precisely what the representative book of the coming

<sup>1</sup> *Journal of Geography*, XI, 73.

<sup>2</sup> *Journal of Geography*, VIII, 1, 159.

<sup>3</sup> Among other notable articles and discussions, all having the same general purport, I would cite as especially valuable, The Round Table Conference on Geography for Secondary Schools, led by Dodge at the 1908 meeting of the Association of American Geographers; the conference on the Organic Side of Geography, its Nature and Limits, led by Brigham at the 1909 meeting of the same Association; Physical Geography in the High School by Ramsey *School Science and Mathematics*, XI, 838 and XII, 45, 114; and High School Geography: What of its Future? by Whitbeck, *Educational Bi Monthly*, June, 1911.

decade will be. I venture to predict that it will be thoroughly biogeographical, economic and human, that the treatment will be largely regional, that the unit regions and divisions will be more natural than political, and that the principal countries of the world will be included in its scope.

The new geography will be richer in both quantity and quality of information, and will not be lacking in scientific discipline. It will not be exactly the kind of discipline furnished by laboratory physics, chemistry, or botany, but a truly geographical discipline, in which that of natural science, technical science and social science will be effectively blended. Such information and such discipline yield to no other in value for training the men and women of the coming generations, who are to be in a deeper sense than any before citizens of the world."

The paper was discussed by Mr. Frank H. Colyer, of Southern Illinois Normal University at Carbondale.

Prof. H. A. Hollister then gave a short talk on "How a Section in a High School Conference may do Its Most Effective Work." Prof. Hollister pointed out the need of (1) a syllabus for a full year's course in physiography suggesting both descriptive work and laboratory and field work, with recommendations as to literature, maps and charts, and laboratory equipment; (2) a syllabus for a half year's course, as an introductory course in science, with an outline of laboratory and field work, and with specific recommendations as to literature, maps and other accessories needed. He further called attention to an insistent call for a co-operative study and outlining, by sections, of the important physiographic features of the state of Illinois, to be published by the state for the use of the public high schools. Such a work might, very well be undertaken by the geography teachers of the different sections acting in co-operation.

Dr. Rich and Prof. Ridgley then outlined possible plans for the work of the conference during the coming year and called upon the conference to express its wishes. The following motion, made by Mr. Cox, was seconded and passed: That a committee whose chairman should be the chairman of the general executive committee, be appointed (1) to prepare an outline syllabus taking into consideration, (a) order and content of topics, (b) suggested list of laboratory exercises, (c) suggestions concerning field trips, (d) lists of reference works, maps and other apparatus; (2) That the committee be large enough to enable it to work in groups upon the different topics.

Moved by Supt. C. H. Brittin of El Paso, that the executive committee constitute a part of this larger committee. Seconded and carried.

Moved by D. C. Ridgley that the section urge the publication by the State Geological Survey of "The Geography of Illinois," at as early a date as possible, or as soon as a suitable man could be secured to write the Geography. Seconded and carried.

Moved by Mr. Frank H. Colyer that the conference commend Prof. Hollister's suggestion that a cooperative study and outlining by sections of the important physiographic features of the state of Illinois be published by the state for the use of the public high schools and that the matter be taken up by the syllabus committee who are empowered to take such action as may seem best. Seconded and carried.

Moved by Mr. J. H. Smith that the members of the section express their hearty appreciation of the able address of Prof. Dryer. Seconded and carried unanimously.

J. T. KIRK, Secretary.

### MANUAL ARTS SECTION.

This section met in the morning in Room 421, University Hall, and in the afternoon in Room 401, Engineering Hall, thus giving an opportunity for those in attendance to see the equipment and displayed work of the departments of Art and Design and Architecture. Professor E. J. Lake presided.

Papers were read as follows: "Design in Education," by Mr. C. F. Kelley of the University; "Design in Manual Arts," by Professor S. J. Vaughn of the Normal School at DeKalb; "Co-operation in Art and Manual Training," by Clara E. Ela of Normal University at Normal; "Machine Drawing of the Proposed Outline for a Second Unit in Manual Training," by Mr. F. S. Needham, Oak Park Township High School. These papers were freely discussed. Following are abstracts of the papers in the order presented.

### Design in Education.

By Charles F. Kelley, University of Illinois.

It is a well-recognized fact that the object of design is the achievement of beauty, and yet it is extraordinary how very few systematized ideas there are for the teaching of this most important subject. We are afraid of the Fine Arts, we approach them on tiptoes with bated breath and speak of them in terms which are often, to say the least, baffling, and hesitate to consider them in a straight-forward and direct manner, because we have been told that art is a very mysterious and subtle thing, something that can't be thought about successfully, something that must be dreamed and hinted at, something that appears only to certain god-gifted personalities who are too often unable to transmit their wonderful perceptions and intuitions to the rest of us poor mortals who have the misfortune to be commonplace and normal. It is a matter of common knowledge that many of those who are engaged in the pursuit (a good figure certainly) of the Fine Arts, are very pleasant intelligent people, very sensible in conversation until the subject of art appears, when they, at once, become unintelligible.

If art is to have a mission in this world that mission will not be accomplished by its shrinking from the gaze of the public and sheltering itself in the souls of those who alone, have the divine power of perceiving it, and in consequence do not need it as much as others who are starving for a new outlook, and have been denied that wonderful and awe inspiring "artistic temperament." This may seem rather far afield, but in reality, it has directly to do with the subject, at least as it appears to me. I wish to champion the cause of clear thinking and direct statement in the Fine Arts, and the intelligent discussion and appreciation of them rather than the mawkishly sentimental raptures which so often herald the very decadence of art.

This may be accomplished most readily I think, by the teaching of design in all branches of educational institutions from the kindergarten to the university. Design, as an abstract quality, is recognized as underlying all branches of the Fine Arts, and therefore, some knowledge of it must result in the more intelligent creation and appreciation of objects of art.

We may divide education into two parts: the first practical, in every-day parlance, and the second esthetic. By practical education, we mean the acquirement of utilitarian knowledge which will equip us for the struggle for existence—the survival of the fittest. Bread and butter is really of primary importance. But the secondary and esthetic consideration does not lag so far behind. Having once fed the man, and given him a little money in his pocket, he is inclined, especially if he be a woman, to wish to spend that money, and to the best advantage. If he have esthetic training, that will aid him materially in purchasing things with which to surround himself—things which he will not easily tire of, and which will gain in charm, the longer he possesses them. That is to say, esthetics have a definite economic value, and the sooner this fact is perceived, the sooner will esthetic education be demanded rather than tolerated.

Design always appeals to the layman as the most practical of the arts, and if it can be taught in the schools in such a manner as to show its bearing upon the necessities of life, it will have a direct and stimulating reaction upon all esthetic education. I am sorry that I have not a first-hand knowledge of the methods of

teaching design in the grade schools, and high schools of this part of the country, but I am concerned, in this paper, with the points of design to be emphasized in its teaching, and not with the pedagogical side of the question with which you are all so much more familiar than I.

Imagination is one of the most valuable assets one can possess, and, while it differs in intensity, in different people, few are without a fair share of it. Very few, however, develop it, or consider it of any practical value. The public expects the artist of course to have an imagination as an essential part of his stock in trade, perhaps, because they do not consider him as of any great practical value, but how many would be very much surprised to learn that the greatest historians and mathematicians have confessedly owed their pre-eminence to the development of imagination. It can lift us out of ourselves and sordid surroundings, giving a new outlook on life which will be directly reflected in the better quality of the productions which result from the exercise of that faculty. Imagination is an intangible thing which may best be gotten at by induction, indirectly, but we know many ways to stimulate and organize it. The aim of the teaching of design should be primarily, the stimulation of the imagination. Little children, inventing stories which seem to them to be very true, are only exercising their imagination. It is developing rapidly long before the reasoning power is present to any marked extent, and we are, nevertheless, constantly surprised by the ability of the youngsters to put two and two together with accurate results. Children are imitative and yet adventurous. We may cultivate their imitative faculties only, causing them to produce the same sort of design as does their teacher, or we may take advantage of the other side of their nature, and, as a sort of game, urge them to find new combinations of simple things which will stimulate the spirit of competition and bring out the child's own ideas. I believe that a great deal of harm is constantly being done by teachers who work in the first manner exclusively, and stamp a mediocre personality upon all their students' work. Designs done in this way, appeal to the eye alone, but if the child be made to exercise his imagination and sense of discrimination a sensuous appreciation of form and color will be developed which will be very valuable in later work. As soon as the child has some reasoning power an attempt should be made to show him why things are good as design, and if possible, why they appeal to him or to others. Of course, a certain baffling element enters here, inasmuch as design is only in part analyzable; but the amount of analysis possible in any work of art is sufficiently large to be of great value in the formation of habits of analysis and appreciation.

My students are of college grade and at least of high school intelligence—in other words, they vary, but I have employed the following methods with them with some degree of success, and I see no reason why it cannot be applied to younger students with less developed habits of thought.

We divide design into two parts, inorganic and organic. Inorganic design, the sort with which young children are often familiar, regards merely the agreeable relationship of shapes and colors as such, without any further consideration. Organic design, the higher form, deals with the relationship of the form of an object to its function. Now this function may be practical or ideal, or both, in combination. It may serve some strictly utilitarian purpose, it may have for its object only the pleasure it gives to the beholder, or it may be designed with both these objects in view, and this, it seems to me, is the highest form of design.

Prof. Santayana, in his *Sense of Beauty* says, "We have accordingly in works of art, two independent sources of effect. The first is the useful form which generates the type, and ultimately the beauty of form when the type has been idealized by emphasizing its intrinsically pleasing traits. The second is the beauty of ornament, which comes from the excitement of the senses, or of the imagination, by color, or by profusion or delicacy of detail." He further emphasizes the fact that long observation of purely useful forms has developed a train of associations which leads us to regard useful forms as beautiful.

This means that the student, in approaching his problem, should learn to consider first its most important aspect, and this is generally some phase of the use to which it is to be put. If a chair, it must be comfortable to sit upon, or if it be a pitcher, it must pour its contents into the coffee cup, and not upon the table cloth. But we know too that the most comfortable of chairs may have been relegated to the

attic on account of its disreputable appearance, and that some pitchers are so ugly, that we can't abide them even if they do pour well. The object to be designed, therefore, should be considered first as an object of use, and then, no less important, its appearance should be designed to give pleasure in use. This involves first of all, reasoning, discrimination, and the exercise of the imagination, rather than an appeal to the illusive sensuous nature. Let us remember too, as Santayana has shown, that the creation of an object of use entails in some degree at least, an idea of beauty on account of associations and that therefore the use and the appearance are inseparable. It may be that a great deal of the ultra-modern European work which is so distasteful to us, may appear so by reason of its lack of associations, and our failure to connect it with objects of use with which we have been familiar. It is well known that the very desire of the modern German Kunstgewerbeschule has been to break away from these associations or traditions as they are called.

If the student is made to feel that design or decoration of any sort has a real practical value for him, and that each problem will have an individual appeal to him, his interest will most certainly be aroused, and that is the most difficult task for the instructor.

The basis of the beginning course in design as it is given here, is a number of exercises in composition of spots, lines and areas, to emphasize the laws of repetition: sequence, rhythm and balance. This is essentially inorganic design, but as each problem is presented numerous examples of organic design from all parts of the globe are shown, that the student may see how the merely pretty, or beautiful space divisions, curves and lines are affected by the technique of the material in which they are executed. To that end, it is absolutely essential that there be some acquaintance with the crafts. I do not consider the university, or the high school for that matter, to be the place for the acquisition of a fine manual dexterity or the mastering of a craft. The student's chief concern should be the acquisition of ideas and the constant widening of horizons. One may learn the cutting of a stencil or the making of a block-print in fifteen minutes. With even this slight amount of technical work, the student will better understand what he should learn about a craft before he can design successfully for it. There are many so-called arts and crafts courses in high schools and universities that are undoubtedly of much value, and in these, I would urge that the student be allowed to execute nothing which he has not designed himself. He may be able to say with some pride as did William in *As You Like It* "A poor thing, but mine own." The joy that shines from the faces of the young designers who have finally produced something that is really and truly theirs, is worth all the trouble that the production has caused, for we all know that it is often much easier to suggest a better scheme than it is to retain the scheme in hand and bring something worth while out of it.

Occasionally I ask the students to make a design and I leave the choice of subject to them. Naturally they come and ask for suggestions, and it works out something in this fashion: "Is everything in your room as attractive as you would like to have it," "Oh! No!" "Well, take the ugliest thing there, and design something to replace it." That is very frequently done, and it often marks the beginning of an understanding of the importance of a knowledge of the subject. Some even become so interested, that they design their own gowns and the decoration for them rather than take something from the fashion papers.

The reason for their interest seems to be that they can obtain satisfactory, and often beautiful results without possessing any great facility as draftsmen or colorists. It is only necessary that they think for themselves and work conscientiously. Many students who have been unable to obtain any facility in drawing (commonly known as talent), develop an interest in design that really is of far more value than the work of the clever tricky youngster who is persuaded that he is an artist born. This very fact, in my opinion, makes the course of very definite value for any student, for it will nearly always bring him into contact with esthetic matters when other methods which depend less upon the reasoning power and more upon perception have failed.

Certainly our problem is not the educating of a race of designers, but there is no reason why we should not educate a people who will appreciate beauty and will demand it. There is no doubt, that this can eventually be brought about by the thoughtful teaching of design in our schools and colleges.

## The Need of Good Design in the Manual Arts.

By Prof. S. J. Vaughn, DeKalb, Ill.

Not long ago, the chief claim of a subject or an activity to a place in the school was the fact that it had the sanction of time; that in spite of changed conditions and new psychology, it had held its place. We are now face to face with the proposition that a subject in the curriculum or an activity of the school must stand on its merits and appear in open court and show cause why it should not be kicked into Kingdom Come. It has fallen to us to revive the Apostle's injunction to "try all things and cling to that which is good." At least we are "trying all things."

Whatever our practise may be, but few will question the sanity of our theory that the knowledge and training of the school should function in the actual life and activities outside the school—that they should influence in a vital and positive way, the conduct of the boys and girls as they leave the schools for the practical workaday world.

Imagine the bewilderment of a master craftsman of the Middle Ages on being asked the need of good design in connection with his craft! In those times, when men wrought miracles in wood and stone and metal, it never dawned upon them that there could be a division of their work into beauty, ornament, etc., on one side, and construction on the other—two separate things to be bound together. They were a unit—two phases of the same thing. They grew up together as necessary and inseparable factors of the complete idea.

It remains for us in these latter days, to talk about trying to unite design and the manual arts. It is an old and familiar story how they became separated, and how we vainly imagined that there was a yawning chasm between art and manual training. We manual arts teachers have some times been chided by our art friends about what they termed the "crudeness" of our design, or the lack of "grace and subtlety" in our lines.

Well, let's be frank about it, and say that there might have been some room for improvement, but that we are moving along with earnest intent and noticeable progress. I wish to speak first of the two-fold aspect of the subject of design as it relates to the manual arts—namely, constructive and decorative design—and to mention some misapprehensions which have gained some prevalence.

Speaking of design, a friend of mine, a prominent member of the faculty of a great university, once said to me: "Would a piston rod be better if it had flowers on it?" I answered that the absence of flowers or any decoration whatsoever is often the very essence of good taste which is a combination of good design and good sense. The question of course was prompted by the impression that the term design is synonymous with "flower-covered"—the impression that design has to do only with ornamentation. This illustrates the view which disregards the constructive features, the creation of an object for a definite purpose.

I suppose the unfortunate term "applied design" was used to overcome the impression that a design is a paper pattern which may be attached indiscriminately and with impunity to anything which comes along, and whose only relation to the object, may be one of glue. Mrs. Young tells of a teacher who required each boy in a city school to make a bootjack and to paint on its immaculate face an American Beauty rose. And why not a rose on a bootjack as well as in a hand-painted soup plate? The most exquisite decoration could never make an ugly thing beautiful. A so-called design, no matter how beautiful its conception, and skillful its execution, may become the very height of bad taste by an ill-judged and ludicrous application.

Just here, it may be stated broadly, that design is a concrete expression of an idea in line, form, and tone composition. A broad conception of a proper and complete design, from the standpoint of the useful arts, demands that a definite need shall furnish the problem and supply its conditions and limitations. Then the effort is made to plan the object so that with good construction, it will be adequate to serve the ends of utility, to take its place in harmony with its surroundings, and to satisfy the sense of good taste in the home or in the community.

The great hope of design is to produce a refined taste and a discriminating judgment; a love for beauty even in the most common place of things; an appreciation which brings satisfaction, richness, and completeness into life, and the ability to organize one's home or environment into a place of beauty and charm and comfort.

Besides the personal refinement and satisfaction, the artistic needs in the industrial world and in the home are the great motive forces in this movement. It would be a godsend if by some means, the boys and the girls and the men and the women could be endowed with the "homing" instinct, and then could be endowed with the good taste to make the home attractive and satisfying. The homemakers always select the most beautiful furniture, the most tasteful tapestries, the most exquisite pictures and decorations—according to their standards of taste. There is no record, so far as I know, of any human being's deliberate choice of the ugly and the crude. But why the oddly significant impression conveyed by the adjective "homely" instead of a sweet pervasive, beautiful significance?

Is it not true that homes are often filled with, not cheap, but weak, ornate furniture often upholstered in expensive, gaudy, flowered materials? Are not the wall papers a great mass of clinging vines and festooned flowers, of golden sunsets and highly colored landscapes? Does there seem to be much effort to adapt the furnishings and the wall papers to each other? As we enter, do we not have to walk on great garlands of flowers laboriously worked into the rugs on the floors? Are not the walls littered with chromos, and mottoes, and photos, and curios, and various other "oes" and "toes," each bringing its peculiar harshness into the general clash of things?

Let us proceed to the dining room. The table is set, there sits Mary Queen of Scots complacently under the hot biscuits in the bread plate; Sir Galahad in splendid knightly armor strides gallantly across the bottom of the greasy meat platter; fuzzy little moths rest their weary wings around the edge of the butter dish; and as the soup recedes, dainty lilies of the valley lift their dazed heads from the limped depths of the soup bowls and faintly murmur, "never again."

It is often a relief and an inspiration to pass from the ornate dining room to the kitchen where each item fits in harmoniously and makes it appeal through plain, simple beauty and perfect adaptability to service. The tragedies I have seen in the home! Not those of infelicity, incompatibility, dissension and divorce, but the more subtle, contributory tragedies of Indian-head sofa pillows, over-ornate china, green jewelry, punched brass and pyrography. God save the home!

Let it be remembered that the boys and girls of our schools become the home makers. Serious efforts have been made to give them the proper basis for the development and exercise of good taste, but the fact remains that our efforts, like a good deal of the school training, have some how failed to carry over into outside activities and to function in actual life. It is extremely difficult to develop an appreciation, and so it is ever pressing upon us to devise new and better methods of attack upon these large problems.

Closely allied to the demands and taste of the home are those of the industries. The windows of our furniture houses have been filled with weak and gaudy furnishings to meet a demand on a business basis. They carry what the people will buy, and in turn, the factories have made what the retailers can sell. Occasionally a firm sets out to raise the standard of taste in one line or another. There is a distinct movement among certain furniture factories now to offer only good design and sound construction in an effort to educate the buyers to an appreciation of its worth and beauty. To this end, they are employing the best designers and the most skilled workmen that can be found, using the finest woods and finishes, giving demonstrations, using sane, legitimate advertising. These people are genuine philanthropists.

I have mentioned only the furniture factories, but the same is true of other industries. The great printing and book industry which employs, perhaps, more people than any other industry in the world, has its great army of agents out looking for people with ideas and good taste, and they report the scarcity is alarming. There is not an adequate object manufactured in the civilized world today, which in its final form, is not an expression of the intellectual and emotional life of discriminating thoughtful designers, who have patiently worked it out to meet the specific conditions set by art and utility.

This much time has been taken to emphasize the vital need and the pressing demand for design in the world at large, centering in the home and expressing its activity through the industries.

If the modern industrial world about us is permeated throughout with efforts at design, however bad, in response to a persistent desire for beautified utility in the

home; and if the boys and girls become not only the home makers, but the forces in the industrial world, then good design is an apparent and imperative need in the schools. But if it is to be effective, it must be given where the folk are in school, hence the burden of the problem rests upon the elementary and high school.

I'm saying that in the elementary and high schools just now is being done some effective work in design. If continued and increased both in quantity and time, and if it is more and more connected up with the concrete problems which relate fundamentally to the home and the industries which depend on the home, this work will develop an appreciation which will make impossible many of the useless and expensive abominations which are the commonplaces of today.

The art and manual arts teachers must bend united energy toward making the fundamental principles of design carry over into the activities of home and industry by reuniting the two phases which naturally belong together. This is being done in a limited way, as I have indicated, by using the distinctively manual arts, among which may be mentioned as primarily effective wood working, printing and bookbinding, pottery, textiles, art metal work, etc., and in rather an intimate way perhaps, by the courses in house furnishing and decoration and other domestic art and science courses.

In the wood working courses, there are perhaps the greatest opportunities for genuinely constructive work, and a genuinely constructive problem presupposes a thoughtful consideration of the conditions set by specific use, the demands of the immediate environment, and the possibilities for the most beautiful and satisfying object within these limitations.

I have a strong belief in the wisdom and value of the plan which makes of each problem, a real and complete problem by striving for independence of thought and by drawing upon the experiences and resources of the individual.

However, problems in wood work do not so readily lend themselves to decorative treatment as those of some other lines, but they afford abundant opportunity for, and are perhaps the best means of fixing the fundamental principles governing the use of lines, areas and tones which constitute the basis of all design.

If it is a problem of a library table, the room, the wood work, the other furniture, the rugs, etc., which constitute the environment into which it must go, become the first object of study. With an image of the arrangement and furnishing in mind, the student sets to work to plan a table that will most satisfactorily meet the requirements. If there are serious defects in the environment, the thoughtful person will attempt to offset some of these defects by attention to materials, shape, color, finish, etc. In the course of planning, consideration is given to the problem of whether the areas of the table need enrichment by decoration—whether carving here, beading there or fluting of the legs is desirable to make it more attractive and more worthy of his time and labor. Up to this point in the problem the questions have been largely those of design—esthetic considerations.

By the time the article is completed, a great area of related matter has been thought over, and out of it elements of beauty and utility have been selected and combined into a type. In this, the plan seems to me to develop the highest powers of thinking and to follow an excellent method in all education.

Too often, I fear, we have been content to allow or compel the boys and girls to construct objects of furniture which were of doubtful taste and were unrelated, both in form and finish, to the surroundings in which they were to be placed. I have experienced the mortification of having a boy say of some object constructed: "It wouldn't go with anything we had, so we put it into the attic." In some instances they were used for kindling, and in these cases I have at least had the satisfaction that they had finally served some useful end.

Although both the constructive and decorative features of design are present in the crafts of pottery, printing, bookbinding and textiles, yet the decorative design seems greatly to predominate. It is through these crafts that there may be developed a proper taste in the selection or production of related objects in the home and in the industries, and that an appreciation of the purpose and proper limits of ornamentation may be produced.

Good work in design in such crafts will reach out to related objects and activities in home and industry and will create a proper appreciation of the controlling

idea of decoration, and, at the same time, a fine regard for good proportions and simple beauty of space relations unaided by ornament.

It will make one crave a certain enrichment, perhaps, of a bare cover of a book or an undecorated curtain or the monotony of a solid rug. It will make clear that wherever ornamentation is properly found, it is an essential element of the object; that it intensifies and enriches the inherent beauty, and that without it the object itself would give a feeling of incompleteness. It will make clear that decoration should have some regard for the use to which an object is to be put. It will emphasize the fact that tasteful decoration relates and subordinates itself to the general idea, and does not clamor for attention at the expense of the thing which it is supposed to beautify. Sometimes we forget this and begin to paint pictures on our china, Indian heads on our sofa pillows, and lion heads on our furniture.

As for printing, it not only offers endless opportunities for the application of the principles of design, but it depends for its excellence absolutely upon the knowledge of good design, for, from the art side, it is the breaking up of space by means of line, mass, and color.

The man who would go very far in the art of printing must, in one way or another, develop an appreciation of good spacing, tasteful decoration, and interesting color combinations. It is only by keen discrimination in these things and the breadth and power which they give, in connection with mechanical skill, that one may hope to excel in this line.

If, in our work with the boys in the printshop, by means of careful layouts, sketches for rule and border, making initial letters, tail-pieces and illustrations, we can give them the fundamental things of good design, together with a certain skill in handling the equipment, we shall have done much toward connecting them up with a great world industry so that their progress will be rapid and their success sure.

Bookbinding affords excellent opportunities for the practice and application of the principles of decorative design. The covers, title pages, and end papers lend themselves easily to the work of the designer, and some of the most attractive and profitable work of the school arts is now being done in this connection.

The work with clay in modeling, casting, and building, both by hand and with the wheel, may be made exceedingly practical and especially valuable in connection with work in design. In this respect, it reaches out into the home and may easily be made to effect the selection and decoration of china and other related articles.

Textile work furnishes a splendid field for design. It lends itself to so many kinds of attractive treatment. The simple weaving is an excellent means of giving a reasonable basis for conventionalization where natural units are employed. It comes to one with considerable force why the natural unit must yield to the requirements of materials and processes. The practical working out of designs by weaving, dyeing, stenciling, darning, etc., is full of significance and suggestion with reference to the familiar and necessary objects of the home, such as curtains, rugs, tapestries, etc.

Finally, when our work is related as intimately as possible to the vital activities and needs of the home and the world about us, and when our problems are drawn from the actual needs of the home or community, we have the advantage of the intense reality of the work and the impetus of a vital motive. By taking advantage of our opportunity to bring back beauty into the common things of every-day life, and, in the process, to add strength and beauty and richness to the lives of those we teach, we may purify the sources of much that is sordid and unwholesome in the life of today.

#### Co-operation of Art and Manual Training.

Clara E. Ela.

"Life without work is guilt. Work without art is brutality."

"Art is not a thing to be done, but the best way to do whatever needs to be done."

The meaning of the word art in the minds of many people is misleading. Some think of art as something a little too good for common people, or too frivolous for

the serious-minded. Only a few of the superintendents and teachers in charge of the schools today understand the function of art in the public schools. The heart of industrial education is the training in art. It is the human side of this question more than the commercial that America needs today. Manual training or the manual arts will not last long in our schools if the art element is not strong.

Already we see hints that point to the decline of the work in the shop. Children are beginning to think it is drudgery. There is a little unrest if the hours are late. The first novelty is wearing off. All new subjects are something of a fad at first. In the manual arts the product has often been the center of interest. But students are beginning to feel that is not worth the labor.

Every one must work. Idleness is not the thing sought. We all know the most unhappy people are the idle. But our people must learn to put more into their work. It must mean more to them. There must be more satisfaction or joy. I believe the wise men of Massachusetts saw this must come and they brought a man from Europe as state official, to build up the artistic side of their commonwealth. He worked wherever he found an opportunity. He had night schools and institutes, and he went to the centers of industry whenever he could find interest enough to make a beginning. In due time, the Massachusetts Normal Art School was established and supported by the state to foster the democracy of art. Massachusetts has had for many years, a state director of art education.

We have now in our state one or two men who have been identified with that work. Industrial education does not mean a mere handling of the tools. The use of the tool is only a means to the end. It should mean the creating of the need and the best way of satisfying that need. It should mean better workmen and better work. There is the scientific side as well as the art.

We are so keen to the scientific that needs no explanation. But the American people at present seem so vague as to art we seldom get together. Under the head of art comes first the desire, the want. That may be an individual, a community, or world-wide need. It is enough for me to know my work is worth something to somebody somewhere.

Second—art means honest work—our best work. The more we can put into our work, the more we can get out of it. It is this element of the best that can be developed or trained. This training of the taste is what we mean now by art. The manual training teacher looks to the art teacher to make the work choice in proportions, in line, in space and in color.

The flower or fruit of the art department is in the product of the shop. If our pupils do not choose or make or enjoy the better things, then the teaching of art in the public schools is not contributing its share to the welfare of the people.

In the last decade or two, the demand for well-made articles in our stores makes a very encouraging showing. The interest in craft furniture, simple hand made jewelry, well bound books, may be fairly considered the product of art in our schools.

This formation of taste is the result of knowledge and training. There was a time when it was considered a mere gift, the good fortune of some and the misfortune of others. But now we know there are points in regard to proportion that a student can learn. The same is true of line and space and color. We have no more right to think that truth can be found in these without knowledge than we have to think it can be found in other things. We do not think a man can solve a problem in arithmetic because he can make figures, or write because he can make the letters, or sing because he can make a noise.

There are principles of order and beauty in the objects we make, just as there are in other things. It is this beauty we all seek. The more we understand and appreciate this beauty the richer we are. It is the satisfaction of this desire which creates contentment or repose. In the good time coming, one person may be strong enough to teach the technique of the material, the handling of the tool, and the art idea and it may be, in that time we shall not need as much teaching. The pupils may have far more resources of their own.

I heard a man say not long ago, no wonder the people of the Orient made beautiful rugs. They have been making rugs for ages and ages. But at the present time our students and teachers are a product of a school system that has been very formal. The military and mechanical features have been strong. It has been from

the outside in, instead of from inside out. The creative instinct has been almost lost, and originality for many is quite lost.

The students need so much and a teacher can give so little. So far as I can see, the best way to solve the problem before us, is to put as many teachers as are needed in charge of a pupil or piece of work. One person may be the master of one thing and another another. This is the accepted method in literary and professional schools, and it should be in industrial schools. Even in the elementary school, it may be best to have two teachers in charge of a class.

I visited a class in bookbinding in a normal school, where there were three teachers. One was working with the project, another with the process, and the third with the enrichment. I believe under the present conditions it would be economy to have two teachers; as it is now, the relation is not close enough. The art student often fails to see the application of this work, and the student in the shop sees only the labor of the problem.

The success of such a plan depends upon the teachers. Both should appreciate the purpose of his work well enough to know there are two parts. Art teachers must know more than a little painting and drawing, must be able to do more than paint a few roses on a plate or copy a Gibson head. And a manual training teacher does not know it all when he can hammer and saw. Neither can stoop to the cheap jealousy of which we often hear rumors. Teachers who are sincere in their purpose, and who know their business well enough to appreciate the functions of the other, can bring the two departments together. I have been a party to such a scheme, and I know it can work. When we started our manual training shop, we were fortunate enough to have a man come to us who knew how dependent he was upon the art department. There was hardly a project taken up that we did not plan together. While the students were working it out, I went to the shop frequently. Often the student, the manual training teacher and myself, discussed the problem. I made all sorts of mistakes as to the material. I would plan things too weak for the grain of the wood, or something the student had not the skill to do with his tools.

A great deal of this indirect work can be done, and at the present time it is probably the most efficient in many of our schools. Few of our pupils are ready to attack their work scientifically. They do not understand the problem well enough to study it. A few days ago, the manual training teacher and myself were watching a class through a glass door. We saw a student studying the spaces at the end of a set of book shelves. But this is rare. The average student is satisfied to make the strips all the same length, the same width and the spaces all alike. It is only by faithful and patient nursing that an interest and appreciation and the reason for the choice in such arrangements will grow. Even if we do but little of our work together, if we do our respective parts the results will show in the work of our students after they leave school.

In the elementary school, a few problems in each grade may be in common, as the student goes up into the high school or technical school, the work becomes more and more one. Perhaps the art teacher's greatest opportunity is in the elementary school. There she stores up the nectar that makes the honey. It is a mistake to think that the manual training is entirely dependent upon art or that the art is the mere servant of manual training. While there is much in common each has a function of its own. It is the business of the art teacher to use all the resources at her command to train or develop the taste, choiceness, beauty, or truth. The expression of this may be in the fine or lesser arts. They are really one. A chair may be a poem.

Unfortunately to many, the fine and lesser arts are divorced, and neither commands the respect it should. The fine arts are only a toy for the rich and the lesser arts have lost their dignity. We, the manual arts teachers in the public schools, are working with all our might to bring back to Industry, the art that is rightfully hers.

Discussion of "The Course of Study in Machine Drawing for High Schools," offered at the High School Conference, at the University of Illinois, November, 1910, by Frank S. Needham, Oak Park, Illinois.

When preparing a course of study in machine drawing to be adopted by the high schools of Illinois, for a second unit in manual training, our aim should be to make the course reasonably strong, adaptable to high school needs, and fitted to the pupils of high school age.

In glancing through this course in machine drawing, I note that it is to be preceded by a one-year course in mechanical drawing. I do not feel it is necessary for us to try to cover practically everything pertaining to drawing in these two courses. But, we should determine what the average good high school can do and keep within its reach, rather than to make a course so difficult that even the teachers will say: "Oh, what's the use? We can't do it anyway;" and then perhaps not even take a suggestion from it. The pupils who plan on going to college will have an opportunity to get the advanced work there, and for the pupils who will not go to college, let us devote their time to the best advantage, giving them such material as they can use, appreciate and assimilate.

So what we must consider is: Can the average good high school of Illinois, devote two forty-minute periods daily to machine drawing for the second year, and also take care of the other required studies? And the answer is, "No." Then again, we must ask, if these same schools can devote one forty-minute period daily during the second year for this work? And our answers will vary. Then would it not be wise to consider carefully, in outlining this course in machine drawing—so as to provide an easy division of the course into halves. For in some schools, it may be completed in the sophomore year, while in others, it will of necessity, be completed in the junior or senior year. Many schools have but one period daily for a year to devote to a combination of shopwork and drawing. While others having a double period daily to devote to this combination find a better balanced course, by devoting, say twelve weeks to drawing, a similar amount of time to bench work or wood-turning and the third portion to pattern making, forging, etc. For a school that has such an arrangement as this, it would require four years to complete these two courses—doing about one-half of the course each year. The fact that this course might come in the second year of high school, should guide us somewhat in avoiding the more advanced work.

Considering the course already adopted, it has many good points. There are, however, a few with which I should take exceptions:

In Group I. I do not believe that the place to introduce inking and the use of the drawing pen is so early in the course, for many good pencil drawings are ruined because of the inability to ink well. Take this up later in the course when the pupils have become more or less familiar with the handling of their instruments and this problem will be more readily solved, say after about fifty hours work.

There is an absence of sketching, such as pictorial views or isometric—perspective, etc., or any method to assist the pupil to understand that he is dealing with a solid and not a plane.

I also feel the value of five or six geometric problems early in the course, to assist the pupils somewhat with their geometric construction, such problems as bisecting a line or angle, to draw a right angle, or divide a line into a number of equal parts, etc.

Group VIII. Lettering. Would it not be well for a pupil to become familiar with one good form of lettering before attempting several styles, thus confusing them all? It will not take a great deal of observation to satisfy one's self that very few schools do good lettering during the first year.

Group X. Would it not be well to take up the study of the screw thread on or about this time, allowing some of the projects of this group to go over into next year's work, and consider simpler problems such as door bolt, sheave, etc?

Group XI. The introduction of building plans, elevations and perspective is quite a proposition, for we must consider these as assembly drawings. The pupil has not received instruction upon the details involved. I believe he should become more or less familiar with construction, sizes of materials and quite a bit of the house details, before attempting a problem like this. As for the perspective, he will not use many of the principles learned when he enters the machine drawing even if he should happen to retain them.

Returning to the original topic, the course in machine drawing, it is my impression that it is too difficult to be done well. Many of the problems could be better solved at a later date when the pupils will be more matured and have studied more of their underlying principles. The tendency nowadays seems to be to crowd the work downwards, high schools with college work, the grades with high school work. This work possibly can be done in the high school, but it will consume too much time, and the course, although covered, would be only done so superficially, and then it would be a question as to how much the pupils would really get, and more so, as to how long they would retain it.

#### Aim.

The aim of the course is good, to teach the application of projection to the drawing of machinery; to teach the principles of machine construction and design. I would not place too much emphasis upon the commercial drafting room practise, for this differs so in different shops. This much would be good, from a purely technical standpoint, but with high school pupils, our problem is a greater one, for many of our pupils will not pursue technical training beyond what little they get in the high school. Therefore, we should choose problems that will give the pupils the broader development and training, one that will widen his horizon and one that, more important than any, will teach him to express himself intelligently, so that his thoughts may be translated by others.

#### Content.

The content of the course, I believe, could be modified in some respects to good advantage.

I. Study of machines and lettering. Lettering is one part of the course upon which too much emphasis cannot be given. The study of machines involves too much consideration to be taken up at this time, and should be considered very superficially.

II. Sketching of machine parts and lettering. Sketching of machine parts is exceptionally well fitted to this course; that with lettering are two projects that are more or less slighted in many schools, and which to my judgment, should be given a great deal more attention than they now receive. The pupil's inability to express himself is quite manifest and I know of nothing that will assist the pupil more than this kind of work.

III. Mechanism. The use, design, construction and odontographs. Such problems as gears, cams, etc., are out of place in the average high school.

Designing some elementary machine details such as a pulley of pillow block from a table accompanied with a rough sketch and pictorial view as may be obtained from a catalogue, would prove valuable and in many schools, where models could not be obtained, I feel this would be an exceptionally valuable project. It has worked well under my supervision.

The study of mechanism should be guarded. The study of cams and gears, their design and construction, follows very nicely the study of kinematics, but this is usually studied in college. At one time, I attempted a little work along these lines in my course of drawing for seniors, but I am pleased to say that I gave it up several years ago. I do not believe there is much doubt as to where the drawing and study of this line of work belong. I did not find it any too easy when I studied it two or three years after being out of high school. It kept me busy then.

V. Checking. Drafting room practise varies so much in different shops that it does not need to be dwelt upon to any great extent, for it is but a matter of a short time for an ordinarily bright student to accustom himself to the system of any drafting room, if his general training in drawing has been good. A method of check-

ing should be adopted, its necessity be shown, allowing the pupils to check a few of each other's drawings towards the end of the course would work to good advantage.

VI. Assembly Drawing. Assembly details and assembly drawings are the points upon which most of our energy should be expended. It is the essential of this course and anything that we put into the course must necessarily be for the upbuilding and strengthening of this particular portion of the work, so that it may mean more to the person that may use it.

VII. Tracing and blue printing may very properly enter into this course. There are a number of terms used in the outline which have no apparent connection with the course, such as, structural, electrical, patent office, topographical, etc., except to point out fields wherein the work is applied.

#### Suggestive method of teaching this course:

Group I. My translation of this group, the study of machines, lettering, etc., is that blue prints of a lathe or steam engine are to be procured from a manufacturing concern, and the pupils study these drawings to note the arrangement of dimensions, scales, notes, titles, etc., studying the different type of lettering, their proportions, etc., and any other data that may be found, that the draughtsman may use to express himself more clearly, so that the drawing may be more intelligible to others for whom it is made. This would not require much time and the pupils would probably get a great deal of value from it, thereby realizing the value of good lettering. I would not care to sacrifice very much time for the classification of machines, the study of transmission, their economy and various forms. These problems are too difficult before the latter part of the course and could this not be done better by the teacher of machine work when the pupils make use of these machines? Would it not be better to study more of the smaller details and later, if time permits, to take up the assembled part?

Group II. To study the lay-out for sketch—place for dimensions, conventions, sections, auxiliary plans and freehand sketches are good. The suggestion of using outside time for this work is not practical in many schools, as they do not allow the teacher to demand outside time, so that should be put in as regular work. There has been no provision made in the previous course in drawing, for pictorial sketches, isometric, etc.; therefore, it might be well to consider it early in the course or, what would be still better, to place it in the course already adopted.

Sketching of machine parts and lettering as I said earlier in my paper, has my hearty approval and is one thing that I am anxious to see developed in this course. I would recommend that pictorial representations be encouraged, as well as working sketches. The lettering, I feel strongly, should have special attention, working only with the simplest and most practical styles.

Group III. Regarding Mechanism. The various sizes, forms and proportions of gear teeth, and the study of cams have, in my experience, been most decidedly out of place with pupils fifteen or sixteen years of age. After saying a word or two regarding the speeds of various proportional wheels, I would consider the high school had done all it should attempt along the lines of transmissions. (I do not consider this group practical for high schools.)

Group IV. The portion of the course that deals with detailing should receive the greatest amount of time, care and supervision, but I cannot convince myself that the study of motion diagrams has any place in the course. The arrangement of the sheet, use of notes and the making of good arrow heads, letters and figures are of vital importance.

Group V. Any good checking system may be adopted. I have found that to allow one pupil to check a few of the other pupils' drawings, works very nicely.

Group VI. The uses of assembly drawings and their relation to detail drawings is of great importance. The drawing of the assembly, from the model or from detail drawings made by another pupil, is good practise, but these drawings should not be complicated. I would have some hesitancy in putting a shaded drawing, such as might be used for catalog reproductions, in as a class problem.

Group VII. Tracing and blue printing in the course is good. Blue printing machines are conspicuous in most high schools by their absence, so I feel we must confine most of our efforts to the old style printing frame. Van Dyke prints and other reproduction methods are not especially useful in the high school. They are possible in this course. I have had but little opportunity to use them in my courses. I would suggest that we confine ourselves to the elementary blue print.

To summarize: The course as a whole, is too difficult and there is more outlined than could be done well. There is much in the course that could be taught later with better results. I would suggest that the points referred to in the preliminary course in this paper be given consideration.

That a stated amount of the course in machine drawing be recommended to represent the first one-half of the course, for which a pupil could receive a half unit for college entrance credit.

I feel that the course needs modifying in order that it may have its most useful effect in the broadest way. High schools are not all the same from a manual training standpoint. Their standards are very variable and their courses range from no course at all, and not much accomplished, to that of the equivalent of some of our good technical schools.

We must try to assist both in this course, more especially the lower classification, for they need it, and at the same time, offer suggestions that will be of value to those that are now fairly well organized.

In my work for the past ten years, my aim has been, to find simple problems that will make the principles clearer to the pupils, so that the pupils may get more of the simple knowledge and be sure of it, rather than to make the problems more difficult, thereby creating a feeling of uncertainty regarding the underlying principles.

I am glad to have this opportunity given me to enter into this discussion and hope I have made clear some of my views regarding this suggested outline.

#### MATHEMATICS SECTION.

Meeting called to order by Professor C. A. Barnhart, Carthage College.

Moved and carried, that the Executive Committee of the Mathematics Section shall be composed of three members, to be elected, as follows: at this meeting, one member for one year, one for two years, and one for three years; at each subsequent meeting, one member for three years. The member of the Committee who has served longest shall be chairman.

Moved and carried, that a Nominating Committee of three to nominate members for the Executive Committee, be appointed by the chair. Professor Shaw, University of Illinois, Miss Raymond, Elgin Academy and Mr. Bowditch, Urbana High School were appointed.

The report of Committee on ways and means of undertaking some experimental study of certain teaching problems of the high school teacher of mathematics was presented by Mr. G. A. Harper, New Trier Township High School and Mr. M. J. Newell, Evanston Township High School.

Discussion of the report was led by Mr. C. A. Pettersen, Carl Schurz High School, Chicago. A summary of the statistical details of the report was presented by Professor Barnhart.

Moved and carried that the report be accepted, that the work of the Committee be continued, and that a part of the program shall be the presentation of two tests, one in algebra, and one in geometry, as final tests to be given at the end of the first year in each subject, together with such modifications as the Committee shall deem wise to make.

Moved and carried, that the selection of the new Committee be left to the new Executive Committee. It was suggested that members who live in the immediate vicinity of the University be chosen.

Meeting adjourned.

At the afternoon session, the membership of the new Executive Committee was announced: Dr. Lytle, University of Illinois, one year; E. H. Taylor, Charleston, two years; C. A. Pettersen, Chicago, three years.

The following papers were presented:

"The Psychology of Some Common Errors in Elementary Mathematics," Prin. T. J. McCormack, Township High School, La Salle.

"Mathematical Literature for High School Teachers," Prof. G. A. Miller, University of Illinois.

W. W. Denton, Secretary.

Following is the report of the Mathematics Committee:

Your Committee, appointed by the Executive Committee of the High School Conference of the University of Illinois to devise definite tests and methods of procedure for the scientific study of some particular questions included in the teaching of mathematics, desires to submit the following report:

The personnel of the committee was finally completed April 16, 1912. It held its first meeting in Chicago, Saturday, April 27, at which time the following two plans of procedure were adopted:

First—a questionnaire to be sent to all the teachers of high school mathematics in the state.

Second—Sets of suppositional examination papers to be graded by as many teachers as possible.

#### Questionnaire.

1. Shall we teach more arithmetic in first year algebra?
2. Shall cancellation be permitted in a course in first year algebra?
3. Which method is best suited for teaching the factoring of  $ax^2+bx+c$ ?  
(a) cross multiplication, (b) completing the square, (c) introducing an auxiliary factor to make the first term a perfect square.
4. What per cent of your algebra pupils, as determined directly from your class records, obtain the full credit at the end of the first year?
5. Does a sufficient amount of algebra enter into the ordinary class room work in geometry?
6. Shall the methods of construction work in geometry be presented before the formal proof of them is possible?
7. Shall we introduce the trigonometric ratios into plane geometry?

8. Are you willing to assist the committee in any definite tests that it may plan?

9. Please suggest any other topic you wish to have discussed.

Four hundred and one copies of the above questionnaire were mailed on May 11th. Thirty-six per cent of the teachers addressed, replied on an enclosed self-addressed postal card. A tabulation of their reports is given below:

No. 1. Yes—66. No—69. Indefinite—6. Total—141.  
 No. 2. Yes—122. No—16. Indefinite—1. Total—139.  
 No. 3. (a)—76.5 (b)—33. (c)—16.5 Total—126.  
 No. 4. Question and replies both unsatisfactory.  
 No. 5. Yes—48. No—86. Indefinite—3. Total—137.  
 No. 6. Yes—90. No—43. Indefinite—4. Total—137.  
 No. 7. Yes—50. No—80. Indefinite—7. Total—137.  
 No. 8. Yes (unqualified)—126. Yes (qualified)—10. Favorable—8.  
 Unanswered—3. No—0. Total—147.

No. 9. The leading suggestions were:

- (a) Graphs, necessity for, amount to be done, and advantages.
- (b) The value of more concrete work in geometry making practical applications of principles.
- (c) Closer correlation of algebra and geometry with the aim of unifying them into a three years' mathematics course.
- (d) How to convince the student that mathematics is worth while.
- (e) Home work versus work in class under supervision.
- (f) The placing of algebra and geometry in the second and third years preceded by a half-year of high school arithmetic.

The teachers were requested to indicate by A, B, and C, their preference, for discussion at the conference, of the topics suggested in the nine questions. Only forty-five replied to this request. In tabulating, the replies were weighted as follows: A—5. B—3. C—2. Topics suggested in No. 9 were considered first choice, or A, with weight—5. The results were: No. 6—92. No. 1—80. No. 5—62. No. 7—46. No. 9 (a)—28. No. 9 (b)—25. No. 2—25. No. 3—25.

#### An Investigation of Methods of Grading Examination Papers.

A set of eight questions with four suppositional answer papers were submitted to a large number of teachers for grading.

- (1)  $\frac{2x-3}{4} - \frac{9+3x}{5} - \frac{8+x}{2} = \frac{x-6}{12} - 4$  Check.
- (2)  $(2x+3)^2 - 3(2x+5) (x-7) + (x+2)^2 = 32 - x^2$  Check.
- (3) A picture without a frame is 9 inches by 12 inches. How wide a frame must be added to increase the diagonal 3 inches.
- (4) An exercise in multiplication and division of fractions.
- (5) In an isosceles triangle the angles opposite the equal sides are equal.
- (6) In the same or equal circles, if two chords are not equal, the greater is nearer the center.
- (7) The line parallel to the base of a triangle bisecting one side bisects the other side and equals one-half the base.
- (8) If two triangles have two sides of the one equal respectively to two sides of the other, but the included angles unequal, then the third sides are unequal and the greater third side is opposite the greater included angle.

The committee prepared the answer papers with a view of illustrating the more common mistakes. The four suppositional students are "A," "B," "C" and "D." Below is a partial report of the results of the grading by sixty-five teachers.

A. 1. In collecting terms  $-30x$  is changed to  $+30x$ . The work is otherwise correct. The answer,  $6\frac{6}{19}$ , is of course incorrect, and not checked. This result was graded 90 by one teacher and between 80 and 90 by several others. Nine marked it 0, but the majority of the grades ranged from 40 to 70.

A. 2. This work is entirely correct excepting two signs in the checking. It is marked 100 by fifteen and between 85 and 100 by a great many. Thirteen, however, have graded it from 75 to 50.

A. 3. This work is a good illustration of the type of student who expresses things carelessly, but yet is generally correct. Twelve have given the solution a grade of 100 and the majority have ranged from 80 to 100. Some have marked it as low as 40 and 50.

A. 4. The factoring is correct except the second denominator. The divisor is inverted, but the rest of the work is almost entirely incorrect. Twenty per cent of the teachers graded this 0. The highest grade was 85, and several were above 50.

B. 1. Several errors in signs, adding, etc. The work is generally incorrect. Eleven have marked it 0 and seven 80 or higher. The highest grade is 90. Nineteen of the grades are above 69 and nineteen below 31.

B. 2. "B" multiplies each of the two factors of the second term by  $-3$ . He then reduces his equation to a quadratic equation and stops with no further attempt to solve it. He is given 0 by sixteen, and less than 41 by more than two-thirds of the teachers. Seven, however, have marked his work 70 or above.

B. 3. This work is clearly expressed and is correct to the last one or two steps of the solution of the quadratic equation. One-fourth of the grades are below 51 and more than one-fourth are above 79. Three are 90, one is 95 and three are 0.

B. 4. Entirely correct except that the parenthesis is omitted about one of the factors. Cancellation is not used. More than one-half of the grades are 100. The others are scattered, even to 40 and 50.

C. 1. One hundred twenty is used for the L. C. D. instead of 60. The remaining part of the work, including the checking, is correct. Forty per cent of the teachers have marked this 100 and nearly all of them have graded it above 84.

C. 2. In the final equation,  $43x = -86$  is changed to  $43x = 86$ , giving 2 for the answer instead of  $-2$ . No check. One-third of the grades are above 79, while more than one-third are below 61. Three are 0.

C. 3. Forgot to frame picture on both sides, otherwise correct. Six are 100, several are between 90 and 100, one-half are 50 or below, and nearly 20 percent are 0.

C. 4. Several serious errors. Grades are scattered pretty evenly from fifteen zeros to two grades of 100. Thirty per cent are above 69.

D. 1. Forgot to multiply  $-4$  by the L. C. D. Other serious errors. Thirteen have marked this over 69 and eleven have given it 0.

D. 2. Practically without value. About 40 per cent have marked it 0, but 15 per cent have graded it above 49.

D. 3. Makes the diagonal of the picture coincide with the diagonal of the frame and uses the Pythagorean Proposition to get the diagonal of the small square at the corner of the frame. The work is of course entirely incorrect. Twenty-five teachers have graded it 100 and nine 0. Thirty-nine have marked it above 69.

D. 4. Serious errors in factoring and reduction. It is graded above 69 by thirteen. The other grades are very low.

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### Geometry.

In answering question 5, student A bisects the vertical angle by a line meeting the base at D and then, without explanation, assumes this line perpendicular to the base. He uses the two right angles at D to prove the triangles congruent.

The details of his proof are fairly complete and correct. He is graded from 0 by five teachers to 100 by seven and 70, or over, by 42, with an average of 64.

Student B erects the perpendicular bisector of the base and assumes it to pass through the vertex, giving, no reason—an assumption more easily established than A's since it rests on no interdependent theorems. The remainder of his work is good and his gradings are higher than A's. He is marked 0 by six teachers, 100 by eleven, and is passed at 70, or above, by forty-five, with an average grade of under 70.

Student C bisects the base at D, connecting D with the vertex and proves this line perpendicular to the base—two points equidistant from the ends of the base. His proof is the text proof, sometimes given. He is graded under 70 by five and under 90 by twenty, with an average of about 85.

Student D has the commonly accepted brief proof of bisecting the vertical angle and proving the triangles formed congruent, by two sides and the included angle theorem of congruence. His proof is complete, subject to some slight criticism as to details. He is graded below 81 by fourteen, 100 by fourteen, and his average grade is about 89.

Question 6 does not present the same wide differences on the part of the students. A superimposes the circles so that the chords lie in one direction from the same point on the circumference. He does not show why the shorter chord and the center lie on opposite sides of the longer chord, otherwise his proof is fair. He is graded from 0 by three to 100 by three, with 39 gradings from 40 to 70.

B gives the commonly accepted proof with most of its details. He is graded below 70 by five, 100 by seventeen. Most of his grades are between 80 and 95.

C has a good proof but fails to give all of the necessary details. He is marked below 70 by two, 100 by ten with an average of about 90.

D's work is fair. Nine mark him below 70. Seven give him 100—the majority between 80 and 95.

Question 7, intentionally presents a wide range of errors.

Student A calls E the mid point of the side BC, produces the parallel line DE, by its own length, through E to F, and calls the line CF parallel to side AB, without an attempt at explanation. This makes ADFC a parallelogram. The subsequent details of his work are correct. His grades run from 0 by five to 95 by one, and he is given 70 or over by thirty-five.

Student B makes the same assumption as to the parallel line and proves two triangles congruent by means of it. He is graded 0 by eleven, 100 by five and is given 70, or more, by twenty-six.

Student C has the same error following A's plan. He is graded from 0 by nine to 100 by two, and 70 or more by twenty-five.

Student D gives the commonly accepted proof well worked out as to details. He is marked below 86 by twelve.

Question 8 contains some possible errors similar to question 6.

A's work is correct up to the first part of the final step in which he makes the common error of choosing the wrong two sides of a triangle as greater than the third, but uses the proper inequality in completing the step. He is marked 100 by five and below 70 by twenty.

B has a good proof subject to criticism as to details, but is graded below 85 by thirteen.

C's work is graded close to 95.

D assumes that, when the triangles are superimposed with two of the equal sides coinciding, then the other equal side of the triangle with the smaller included angle must cross the third side of the triangle with the greater angle. He does not use this assumption in his proof. His work is graded 50 by one, 100 by twelve, with an average over 90.

The committee is considering the results of the gradings and will be prepared to make a more complete report at the time of the conference. It will provide all interested teachers with a tabulated report at that time.

#### Suggestions for Future Investigations.

The committee suggest three plans for future investigation by the conference: First—A repetition of its grading scheme with a new set of questions and answer papers to be carefully graded by at least 200 teachers.

Second—To give a brief and pointed test in algebra in a large number of high schools to both Freshmen and Sophomores, to determine the difference in levels between Freshmen and Sophomore knowledge of algebra.

Third—A systematic study of one or more of the leading suggestions obtained by means of the questionnaire.

Respectfully submitted,

GEO. A. HARPER,  
New Trier Township High School.  
C. A. BARNHART,  
Carthage College, Carthage, Ill.  
M. J. NEWELL,  
Evanston Township High School.

[Any one desiring a copy of Mr. Barnhart's discussion of the report may be able to get one by writing the High School Visitor.]

Abstract of the Paper on the "Psychology of Errors in Elementary Mathematics."

By Thomas J. McCormack, LaSalle, Ill.

The speaker began by a description of what might be termed the "mechanics of thinking," which in its simplest form he called a reaction-activity, through which the concept, rule or definition takes physical form. The concept is translated into physical reality, or vice versa. Any slip in the translation is error, and the errors will be mostly found in the obstacles that present themselves to this perfect translation.

"Error or confusion springs from the same source as truth. Confusion and reasoning are allied species of the same genus of psychological procedure. Reasoning proceeds both in the unconscious and conscious realms by the fusion of images, percepts or concepts, through the laws of association by resemblance or contiguity, into new images, percepts, or concepts. The attraction or substitution takes place because of the similarity of parts. We substitute a part for a whole, or make two things that are only in part identical, identical as wholes. The impulsion is inevitable. Resemblance, similarity, analogy are the parents and guides of truth, but they are likewise a fertile source of confusion. . . .

"Any similarity evokes by association the concept and hence the name, and so may disengage a wrong reaction-activity. A child calls every four footed animal a dog; later every rectangle a square, or a square an oblong, or even a cube a square, and a sphere a circle. The phrase or direction to 'square the number three' disengages a multiplication-activity which just as often produces 'twice three' as it does 'three, twice as a factor.'

"It follows from this that it is necessary not only to possess the concept, the word, the rule, but also to have performed repeatedly all the sense-operations of counting and visualizing that the word or rule involves. When this is done, in other words, when the drill or the practise is perfect, then the reaction-activities involved in the word or rule are released automatically, at the mention or sight of it, and are performed with mechanical precision.

"It is an inverted criticism to say that a child applies a rule 'mechanically' and 'unthinkingly.' The criticism should be, he applies it 'unmechanically' and 'thinkingly'; for when we do not possess a rule or formula in all its content, then truly do we have to think and struggle from sheer terror of error. Only when the rule is fixed deep and firm, only when its action in all its implication is mechanical and automatic, is error precluded. Mechanism is the last word of mathematics, so far as practise and instructions are concerned. 'It thinks', not 'I think' is the goal and ideal of science. It should be the motto of mathematics teachers: 'Let the formula, not George, do it.'

"Errors mainly arise (1) through the imperfect embedment of the concept in the psychical structures of the mind (improper or imperfect presentment, drill and practise); and (2) through a hitch or kink in the passage or unravelment of the psychical complex, the concept into its proper physical counterpart, the 'development' or the 'answer,' followed by hair."

Considering the first source of error, it will be seen that the reception of mathematical concepts by the normal mind is a psychological process conditioned upon the idiosyncracies of our mental and physiological structure. The pedagogic trick is to discover and to utilize these idiosyncracies; and the psychology of symmetry affords a typical illustration of what these idiosyncracies are. In geometry, figures are recognized as congruent either by an act of sense or by an act of intellect. Figures may be geometrically identical, but physiologically unlike; hence the recognition of identity fails—in which case our sensory mechanism presents an obstacle to the recognition of truth. On the other hand, two figures may be symmetrical to the senses, may hence be declared to be identical, and may yet be nonidentical—in which case, the indications of the senses, or intuition, lead to out-and-out confusion. Our sense-organs are so constituted physiologically, that similar impressions are excited by what may be termed symmetrical sensations, and these similar impressions are readily

converted into impressions of identity. The author illustrated this source of confusion by examples drawn from elementary pedagogy and from the commonest motor experiences of life, showing generally that the automatism of the senses works to the detriment as well as to the advantage of truth. He next showed the pedagogic applications of this theory of the inter-dependence of intellectual and sensory acts, examining the reasons for the traditional presentation of the typical geometric forms in elementary instruction, and showing how deep the results of our physiological structures penetrated.

The question of the symmetry of our physiological sense-organs and of the brain was then considered and was found to lead not only to right-handedness, etc., but also to "right-headedness" in many of our intellectual operations, notably in the handling of algebraic equations.

Then going farther, the author discovered that corresponding to the symmetry of our sensations of space and to the symmetry of our acts of motion and sensations of motion there exists in the mental realm an analogous species of intellectual symmetry. "The motor acts of the eyes, of the hands, and the energies corresponding thereto, must necessarily condition definite corresponding and parallel psychical habitudes. So with the repetition of spoken words. Every motor act or impulse, every spoken word leaves its memory-trace. Just as there is a parallelism between physical phenomena of sound and the fibers of Corti, so also there must be a parallelism between the modes of operation, of the sensory organs or of our verbal mechanisms, and the intellectual or psychical acts that accompany or are evoked by them.

"The repetition of familiar word-forms such as the axioms, will like the replies to questions in a catechism, form thought-grooves, thought-patterns, or thought-models which soon assume independent reality and acquire independent habits of operation entirely disconnected with the facts. So deeply ingrained are these word-patterns in our intellectual structure, that it requires considerable effort of inhibition to prevent new material from running automatically into the same molds. If the new words or the new proposition start in the same stereotyped manner as the old, the entire statement is very apt, if it hits the stereotyped thought-forms in question, to be carried automatically along in those forms. The general symmetry of the thought-form automatically drags with it or super-induces upon itself a verbal symmetry that may enunciate flagrant error. Of this class of errors, the author gives the following very striking instance:

'Magnitudes equal to the same magnitudes are equal to each other;' 'if equals are added to equals, the wholes are equals,' etc., etc.; 'two lines parallel to the same line are parallel to each other;' and then automatically, 'lines perpendicular to the same lines are perpendicular to each other.'

This error, he contended, occurs in both geometry and algebra in a dozen different illusive forms. "We call it in ordinary parlance 'talking without thinking.' But right here precisely, is the difficulty. Almost the entire object of instruction is so to shape our mental activity that we *shall* talk and write automatically without error, correctly, and in accordance with the facts. Whenever we can substitute a flawless piece of automatic talking mechanism for a thinking mechanism in any individual person, then we have to that extent instructed him. As I repeatedly emphasize in this paper, our main endeavor in cumulative mathematical instruction is to get rid of thinking and to substitute automatism for thought, *so as to economize and to conserve our conscious intellectual labor for higher ends.*"

The next topic considered by the speaker was the relation between technical language and scientific method. Here he discussed the theories of Condillac, Pascal and others.

Next were considered the errors that result from confounding similar rules. For example, he said: "Nearly all the rules we are considering *substitute* sheer mechanical, verbal and motor devices for intellectual acts. The operation of *cancelling* is the substitution of a motor act for an intellectual act. A single motor act is sufficient when there is only one term in the numerator and denominator. But the motor mechanism of the learner appears to lose its momentum when the numerator or denominator contains several terms. If the rule were first learned where the numerator or denominator was a polynomial, the error might not have arisen. Or

perhaps the direction of the motor tendency is the cause of the error. One teacher at our last meeting said that he taught his scholars to make the cancellations altogether by horizontal strokes. This is quite in accordance with our theory of the automatic momentum or inertia of motor and intellectual acts. If the rule is taught in *association* with the image of a definite *horizontal* motion, then the direction of the motor act is established and carries the operation through all the terms. *All these rules are mechanical devices and tricks and have in them no intellectual content.* Any such motor device as that suggested by the teacher in question is therefore permissible. It is comparable to bringing objects within the range of vertical symmetry in geometry, and is opening the field to motor symmetry, in the development of the mechanical rules of algebra."

The speaker next showed by historical considerations, that the elimination of error was mainly a progressive removal of the sense-obstacles to thinking. Afterwards he discussed and analyzed the role of the "principle of continuity" in research, and in instruction. Finally, he exhibited the operations of what he called the "Law of Intellectual Automatism" and the "Law of Intellectual Momentum."

He said: "It is the purpose of all science to replace experience. A scientific law is an intellectual working-model which is substituted for the facts in any given domain, and on which the course of the facts can be reeled off automatically by purely intellectual mechanical operations. The discovery, or the truth, of the law consists in the demonstration inductive or deductive, of the parallelism or one-to-one correspondence between the working model, the intellectual machine, the rule, or the formula, and reality. The law of the lever, the law of refraction, the law of falling bodies, are mathematical machines that take the place of the facts; we substitute for the necessary relations of nature the automatic determinism of a formal mechanism; we work the machines and get the facts; we give the mechanisms their automatic course and get the relations. The formula for quadratic equations replaces automatically, the operations necessary for ascertaining the roots; determinants substitute a purely mechanical spatial device for the complex conscious intellectual acts necessary for combining properly the coefficients; the binomial theorem supplants multiplications with a visual, verbal direction; the slide-rule and the calculating machine symbolize the loftiest formal ideals of science—the substitution of an automatic, self-working mechanism for laborious conscious thought. It is the object of science, in this aspect, not to think, but to *get rid of thinking-over-again things already thought out*, and so to economize the whole domain of intellectual effort.

"In the mathematical field this point of view is so simple and self-evident, that it may be taught with the most illuminating effects to the youngest students. I have personally presented, in connection with the rules of algebra, this central and very practical principle of the philosophy of science to secondary students with results that are both delightful and stimulating. For the traditional appeal, 'try to think' I have substituted the advice, 'try not to think,' or rather 'so study that you will not need to think.' 'Relegate to the subconscious automatic realm the processes that are tried and proved, and *save your surplus thought for the intricate relations and operations that have not yet been subjected to that realm.*'

"Plainly this is the object of the largest part of our teaching and drill in algebra—automatism of operation, based on a universal certainty *demonstrate it once for all* for given domains of the universe of forms.

"If we see clearly what this function of intellectual automatism or momentum is for the attainment of truth, we shall understand more readily what the same procedure, *by its excess*, involves for error."

He said again: "In fine, the process we are considering is this: for the facts of nature—here the relations subsisting between forms and magnitudes—we *substitute* a machine, a spatial, or even verbal device, a rule, a formula, and assume an exact parallelism between the automatic operation of the latter and the actual realities of the former. The parallelism may or may not be perfect. The full scope of the automatism of the one may or may not be coincident with the entire domain of the other. But we have control of the automatism; we set the substitutional device or machinery a going, and it goes with an independent momentum of its own that usually in mathematics, carries us to truth, but may, if the parallelism for any reason fails, carry us to error."

The full text of this paper, of which an abstract is here given, will be published in a forthcoming number of *School Science and Mathematics*.

### Mathematical Literature for High School Teachers.

Abstract of Professor G. A. Miller's Paper.

There is no sharp line of division between the mathematics for the high school teacher and the higher mathematics. The only limits are those of ability and time. The teacher who has ceased to thirst and hunger for more knowledge cannot expect perfect success. The rapid changes which make it more and more easy to acquire knowledge tend to higher and higher demands on the teacher's attainments. The rapidly growing libraries are a very strong factor in raising intellectual standards.

The mathematical literature may be divided into two large classes, viz., journals and books. The teacher needs both of these. Journals have the advantage that they present the most modern views and tend towards collaborations. They represent the dynamic in literature while books represent the static. Books present big subjects in a more systematic way and enter more deeply into particular subjects.

Some of the most suitable journals in the English language are the following: *School Science and Mathematics*, *Mathematics Teacher*, *American Mathematical Monthly*, *Mathematical Gazette* and *Annals of Mathematics*. As a reference book of the literature which appeared in the journals during the nineteenth century, Volume I of the Subject Index published by the Royal Society of London is especially useful. The publications of the International Commission on the teaching of mathematics are very useful from the stand-point of pedagogy.

### MODERN LANGUAGE SECTION.

The Modern Language Section of the High School Conference met in Room 212 University Hall with Supt. W. W. Earnest presiding. A secretary was first elected. At the morning session two very helpful papers were read by Prin. R. L. Sandwick, of Highland Park, and by Pres. J. T. Nollen, Lake Forest College. At the afternoon session a paper was read by Dr. Koller on "Method of Teaching Prose Composition." Dr. Koller discussed first the nature of the problem; second, the short comings of present practises; and third, the method of solving difficulties. There are at present various methods of teaching composition; translation of detached sentences into foreign language; by rendering connected story into mother tongue. Old method was to memorize **rules** and then work up material with these rules as the guiding principles.

The idiom should first be presented, and the words and phrases as they exist in the written and spoken language. Then later the rules may be deducted when their truths force themselves upon the student. He should hear, read and write repeatedly German phrases and idioms until they become a part of himself. Translation into fine English does not make up good work in German. To get fine English means to sacrifice the real German. Fine translations mean simply a perfection of one's uses of English. The best way to study the German is to test the child's knowledge of what he has read by means of questioning him in German and having him answer in German—both orally and in writing. Short themes may be written in German with the text as a basis. Translation into English should be used only as a last resort. By hearing, writing and speaking the foreign tongue, one gradually learns to think it. Language study should be made an art rather than a science. Every pupil must be mentally present. The fundamental of each assigned lesson should be explained in advance. The student might give a short resume of yesterday's or today's lesson, which same should be carefully corrected. One must make haste slowly in this work—short lessons, a full use of material. Use synonyms to explain words so as to avoid use of English; point out cognates. Reading at sight and aloud, with very careful correction of pronunciation (acquired as a habit and obtained through imitation and phonetics) are excellent practises. Establishment of German club is strongly recommended. Thorough teachers (with good pay) should be gotten.

A discussion followed as to the merits of preparation in a two years' course, first, using the direct method; secondly, using the grammar method. The general opinion seemed to be, that during the second semester of German in a section composed of students who had been trained by both the direct and grammar methods, the latter at first out-distanced the former; but after a few months the reverse proved to be true.

A discussion was then taken up as to the best means of preparing the student for the classics, when the direct method was used, i.e., in a two years' course. Dr. Koller thought that if the student had acquired a vocabulary of about 800 words and phrases through the direct method (and these would be made a part of himself) he would readily understand the classics. One must go slowly, be patient and learn well what has been undertaken.

The best method of teaching one of Schiller's dramas was next discussed. Most agreed that translation should be only a secondary means.

The text should be studied through questioning and answering in German—summarizing, etc.

President Nollen spoke of the great changes forced upon the child in going from the grades to the high school; the high school to college; and he thought we should some day have to grade the instruction so that there would be no break, each being a logical continuation of what had preceded.

All agreed that the best place to begin the study of a foreign language was in the grades. Professor Nollen suggested that the committee next year arrange for a discussion concerning the removal of beginning language to grades so that when the students entered high school they would have material with which to study German literature.

The meeting adjourned at 4:30.

Following is a summary of the paper by Dr. A. H. Koller on:

#### Method of Teaching Prose Composition.

Composition, it would appear, is being taught in two forms; (1) by the translation of an English text, mostly detached sentences, into the foreign language, this is called composition; (2) by rendering parts of a continuous narrative, a story or the like, of the foreign idiom into the mother tongue, this is called teaching of the foreign language and does not go by the name of composition, which in reality it is, namely, composing not in the foreign tongue, however, but in English. That is all, or almost all that seems to be taught in very many schools in addition to grammatical nomenclature, memorizing of rules and reciting them when occasion and the teacher require it. Whenever the text used, or the story read, forces the teacher by its printed *Fragen* to attempt any oral work, the impression made upon the student's mind is at best a fleeting one for the attempt is mechanical. It is a concession, it lacks spirit, and the results are accordingly.

When the foreign text is the object of the lesson, the procedure is less mechanical, at least so far as the pupil's mind is concerned. For whatever composition there is, it is done in the vernacular. Here the foreign text serves as the associative mnemonic hull, and as an excuse for the parading in class of the English composition prepared at home. If you compare the whole operation to the opening of a walnut, the foreign text is the shell which is cracked open, thrown away unconsidered in order to obtain the nut meat, the English composition. In some cases, the text is not even read, let alone discussed or exhausted. And this disguise deceiving to both teacher and pupil alike, suffers the appellation of instruction in the foreign idiom.

It is characteristic of our teaching that we "assign" lessons instead of preparing each lesson in class, in advance during the previous hour, at least in its fundamental aspects, i.e., in stead of preparing the pupils at each hour for the next lesson by pointing out its fundamental features, and by explaining whatever seems necessary to put the pupil in an intelligent position to prepare his lesson.

It is equally characteristic that we have "recitations" to which we listen more or less, mostly more.

I hold that composition is not a mechanical and an isolated part of foreign language teaching. It is rather an organic and vital part of the same and should be so treated. It is therefore intimately and inseparably bound up with one's entire method of instruction.

Let us analyze, first, what the learner does in preparing the typical composition lesson referred to. He looks up in his doctored vocabulary, English nouns, verbs, etc., chooses, if he finds more than one given, according to his fancy and arranges

them to suit himself. The conscientious learner will follow his English model closely and his German sentences, at their best, might serve for a German boy struggling to learn English as a model for a correct English sentence. The sentence thus translated, even if rightly corrected in class, will and can leave but little or no trace, no permanent trace to be sure, upon the learner's mind. He is in need of hearing, speaking and writing, and that over and over again, German phrases, actual living German sentences. Otherwise he profits from the performance little or nothing.

Second, let us analyze what the student does in breaking up the foreign text to obtain what I termed his English composition.

He looks up the meaning of each foreign word, or if skillful, looks for the meaning of phrases or rather looks for phrases and their meaning, guesses or finds out the exact English equivalent of a given foreign sentence, then he polishes his English until it becomes tolerably fair, good or excellent, according to his ability in the vernacular. Here the learner at best improved his English, and the better his English, the farther removed he is, as a rule, from the foreign tongue he is supposedly learning. He had to draw on his resources and knowledge of the vernacular. Operation in his mind with the elements of the foreign language is not in the equation. Even the odd foreign word or phrase which excited his curiosity or which perhaps made him smile, he will soon forget, for the foreign form or content was not his absorbing or chief concern. Let it be clearly understood then, first, that in translating absurd or good English sentences, say into German, if this form of composition is exclusively insisted upon, or if most of class time is spent thereon, the learner is undertaking a task that can be successfully accomplished only by one who masters the forms and idioms of German completely. The learner could approach this ideal, proportionate to the extent to which he has been supplied and saturated with real German sentences. Here in America, in most instances, this supply must be furnished by the teacher, since the learner is limited to the class-room for his hearing of the foreign speech. It is evident then that this form of composition cannot be made the main part of instruction and must not occupy most of the limited time at our disposal and should be sparingly used as a text to determine the degree to which the student appropriated foreign phrases and sentences learned before. Second, let us clearly understand that in translating a German narrative into poor, mediocre or even good English, we are involved in teaching the vernacular. The German narrative is the text. After it served this purpose, we discard it. For any consummate rendering a rare ability in the vernacular is a prerequisite. In school translations if you make that a supreme task (or if that it is alone or mostly for which the student is held responsible) the foreign language will receive no, or very little share of attention. The student will endeavor to give his best English; the German text, context, will be a mere reminder to him of the English garb. What remains with the student then in this form of composition, is the thought of the text as the student fished it out of that text, and not any of the forms or content of the German language as such. Now the question is, do we wish to teach the art of translation which is a category of endeavor, distinct and separate from both the art and science of learning the vernacular and of that of the foreign idiom, or English composition alone instead of the German language? It is obvious then that this form of composition should be used extensively or exclusively only where the purpose of teaching is to get the ideas of the foreign book, e.g., Scientific German, elsewhere only to determine accuracy and exactness of understanding of the text by the scholars, by such teachers who still believe that this is the *surest* and *only* mode of ascertaining whether or not the learner prepared the lesson. Such belief is intelligible because it is rooted in what I termed present practises, and although I do not hesitate to employ translation occasionally, yet it is far from true that translation into the vernacular is either the best or the most satisfactory manner to find out what the student knows of the foreign language. Questions in German by the teacher and both questions and answers by the pupil, will bring that out much more effectively.

Composition should be a composition in the foreign language; that is, it should assume the form of expression by the learner in the foreign tongue, whether in writing so called formal composition, or in speaking or in oral and written answers and questions at all times. In the formal composition, instead of an English text there should be a foreign text as the basis and the model for reproduction by the learner.

Make the reproduction of the foreign text a central part of the scholar's task and the translation of the English sentences merely an additional accessory, or secondary means to fix certain foreign phrases or forms.

The medium of expression in the class-room should be the foreign language at all times and on all occasions, both on the part of the teacher and the pupil alike, whether in asking or answering questions, in assignments, directions to the class and explanations of any nature. This cannot be too strongly recommended. It should be sufficiently stressed and constantly insisted upon. In the periods not devoted to so called formal composition, composition in the sense defined, should be continued. Instruction should assume this form. Let the pupil constantly either reproduce or compose a foreign phrase, part of a sentence, a foreign sentence or a number of sentences. The lesson can and should be controlled in this way. Train not only the pupil's eye, not even only his eye and hand, but his ear and tongue as well. The learner should hear nothing but the foreign sentence. He should attempt to speak nothing but the foreign sentence. He should hear all discussions in the foreign language. He should attempt to write nothing but the foreign idiom, so that ultimately he might learn to think in the foreign tongue. For whatever purpose the student wishes to acquire a knowledge of the foreign language, whether that be understanding, reading, writing or speaking, he is apt to familiarize himself in this wise more permanently with the foreign language by sheer force of repetition and multiplied association.

We are engaged in teaching language as an art and not a science. Here, art comes first, science, second. In teaching the art, the science may and should offer help but it should not occupy the foreground. The teacher should know that science fully and should present to the class the help that that science offers translated into terms of the art.

The lesson may be used, (1) for summaries, (2) asking questions and answers, (3) for simple definitions, (4) for synonyms, (5) for showing a related group of words, (6) for cognates, (7) for antonyms, (8) analyzing compounds, (9) for showing word formations, prefixes and suffixes, (10) for some etymology, (11) for noting, explaining and learning idiomatic phrases and expressions.

I advocate: (1) a judicious use of the direct method adapted to the needs of your class; (2) the foreign language as a sole medium of communication in the class-room, jealousy of the time spent by teacher and class upon the vernacular; (3) the principle of "*frie Reproduktion*," its widest application in all of its forms; (4) I contend that composition should be an organic part and not an accidental, deadening and useless adjunct of instruction in the foreign tongue. (5) I believe the establishment in every school, of a German club, a French club, informally to meet as often as feasible, where the students would participate in all of its affairs, sing the foreign songs, play games, talk in the foreign language informally of subjects of daily routine, politics, school affairs, or whatever captivates their fancy, eventually perform a little play, would not only enliven the student's interest in the subject, and advantageously complement class-room work, but it might also under a trained and enthusiastic leader, prove to be a place for a goodly quantity of informal composition of good equality.

Grant me a word about the teachers themselves. They should be equipped with the theoretical science and practical art of the foreign language, in addition to the science and art of pedagogy. But so many are unprepared. This is of necessity so. They are underpaid like unto those who prepare them. Not until the commonwealth recognizes the need (1) of a thorough preparation for teachers, (2) for an adequate remuneration for their services, can we hope for betterment in modern language instruction.

The following books might be helpful to the teacher of German:

Daniel Sanders: Wörterbuch der deutschen Sprache, mit Belegen von Luther bis auf die Gegenwart, Leipzig, O. Wigand, 3 vols. 1000 pp. each. An abundance of illustrative examples; definitions in German clear and simple. Invaluable for the foreigner. Costs about 80 marks.

You are all acquainted with Muret-Sanders: Encyclopedic German-English and English-German Dictionary in four volumes, and with

Flügel-Schmidt-Tanger: German-English, English-German Dictionary.

Among the school dictionaries, Karl Breul's Revised German and English Dictionary is the best.

William James' Dictionary of the English and German Languages is close second.

Sanders-Wülfing: Handwörterbuch der deutschen Sprache. 8 Aufl; erste der Neubearbeitung, 887 pp. Leipzig, Wigand, 1910. Definitions in German.

P. F. S. Hoffman: Wörterbuch der deutschen Sprache. 7 Aufl. Leipzig, F. Brandsetter, 1910, 620 pp. \$1.45. Its brief and lucid definitions in German are helpful.

Herman Paul: Deutsches Wörterbuch. 2 vermehrte Aufl. 690 pp. Halle Niemeyer, 1908. Gives in German development of meanings.

Konrad Duden: Orthographisches Wörterbuch der deutschen Sprache. 8 Aufl. Leipzig und Wien. Bibliographisches Institute, 1906.

Ignatz Emanuel Wessely: Grammatisch-stilistisches Wörterbuch der deutschen Sprache. Leipzig, Reisland, 1906, 198 pp.

Aug. Vogels: Grammatisch-orthographisches Nachschlagebuch der deutschen Sprache. 7 Aufl. Berlin-Schöneberg, Langenscheidt, 1909 (in Leinenband 2 Mark 80 Pf.)

Grunow: Grammatisches Nachschlagebuch. Ein Wegweiser für jedermann durch die Schwierigkeiten der deutschen Grammatik und des deutschen Stils. Leipzig, 1905, 390 pp.

George O. Curme: A Grammar of the German Language. New York, Mac-Millan, 1905.

Ludwig Sütterlin: Die deutsche Sprache der Gegenwart (Olne Laute, Wörter Wortformen und Sätze) Ein Handbuch für Lehrer und Studierende auf sprachwissenschaftlicher Grundlage zusammengestellt von—Dazu eine Tafel mit 12 Abbildungen, Dritte, vermerkte und verbesserte Auflage, 415 pp. with index. R. Voigtlander's Verlag in Leipzig, 1910.

Eberhardt-Lyon: Synonymisches Handwörterbuch der deutschen Sprache. 17 Aufl. Leipzig, 1910. Durchgang umgearbeitet, vermehrt und verbessert.

M. B. Lambert: Handbook of German Idioms. New York, Holt, 1910, 86 pp. of idioms and 12 pp. of exercises.

F. E. Hastings: Studies in German Words and their Uses. Heath, 1911, 240 pp. index.

A. Schlessing: Deutscher Wortschatz oder der passende Ausdruck, 4 verbesserte und vermehrte Aufl. Eszlingen, 1907, 497 pp. Patterned after P. M. Roget's Thesaurus of English Words and Phrases. And finally,

The Teaching of Modern Foreign Languages and the Training of the Teachers, by Karl Breul. 4 Ed. Revised and enlarged. Cambridge at the University Press. 1909, 174 pp. 80c.

This paper read by Principal Sandwick is given in full, and follows:

#### Teaching the Modern Languages.

In order to answer the much-mooted question, "Does the prevalent system of instruction in the modern languages secure the results that should be accomplished in the time devoted to the subject," it is necessary to know what the prevalent system is, what results are secured, and finally what results ought to be secured. I have long felt that the system of instruction in vogue when I studied French and German fifteen or twenty years ago, was entirely inadequate. We translated into English, studied the grammar, and tried to solve some dry puzzles wherein the trick lay in turning English sentences into the foreign language by means of French-English or German-English lexicons. Each student had one guess at a puzzle, which guess he put down on a sheet of paper and gave to the teacher. The papers were handed back, and we could tell what luck we had had by the amount of red-ink on them; the more red-ink, the less luck. That was the usual system in those days.

Nothing even approaching that system has been seen where I have been for ten years. To know what the prevalent system now is, it was necessary for me to

make some inquiries. I wrote to high school visitors or modern language departments at Lake Forest College, Northwestern University, the University of Chicago, and the state Universities of Illinois, Wisconsin, Michigan and Indiana.

Two of the questions asked were:

(1) What proportion of teachers are using the so-called "grammar method" in which the assignment is translated into English, and grammar exercises are conducted in English?

(2) What proportion of teachers are using the "direct method" in which assignments are read in the language studied and the recitations conducted wholly or almost wholly in the foreign language?

Professor H. A. Hollister of Illinois says in reply: "I visit modern language classes in high schools almost daily. I should judge that only a very small proportion of the teachers use the direct method. The grammar method is the one generally in use in the state of Illinois. I think it will be safe to say that from 75 to 80 per cent of teachers employ the latter method."

Professor Voss of the University of Wisconsin writes: "Two-thirds of the teachers conduct their exercises in English, one-third in German. We advocate the direct method."

Other replies seem to indicate the use of an eclectic combination of these methods. I have recently visited the work of seventeen teachers of French and German, in and around Chicago, and in all the classes visited, I found the translation into English apparently occupying the most important place in the eyes of pupils and teacher. Everywhere there is considerable drill in pronunciation; questions on grammar are asked and answered in English; and there is some attempt at conversation. In the high school programs from two to four years time is allotted to each of the modern languages. Such, however, is the mortality in our high schools that nearly half the students get but a single year in the foreign tongue. The second year of French or German is always a much smaller class than the first, and so few are left for the fourth year, that only the largest schools, starting out with more than two sections of beginners, can afford to organize work beyond the third.

What results are secured in the two to four years devoted to a modern language? I find a few high school teachers who are thoroughly well satisfied with the results of their work. Especially are those teachers satisfied who confine themselves to the definite work of translation and easily fulfill the function of teacher by uttering, from time to time, the barber's word, "next." But those who are trying to introduce conversation and phonetics, and those who are trying to make some use of the direct method, are not satisfied with the results of their work. These teachers generally think that the universities are expecting too much in reading.

What do the university men themselves think of the results of our prevalent system? Universities have been accused so bitterly of dictating the high school course, such a universal howl has gone up about it, that just now the professors are lying low. "The lid is on," and it is hard to get much active criticism from them. But occasionally some one on whom the burden of freshmen work falls, lets out a helpless cry. Here is one in a reply from George D. Curme of Northwestern:

"I have been studying the high school work in German as it comes to us each year in our Freshman class. We are very much discouraged by the results. We find each year students who have read German for two years in the high school who cannot decline the definite and indefinite articles. Many have almost no knowledge of nouns. We cannot do good work in college on the poor basis that the students bring with them. There is a great difference of opinion among teachers as to the methods of teaching and the amount to be assigned for daily work so that the results differ very much."

Charles Goettisch of the University of Chicago says: "My experience with incoming high school pupils leads me to think that a large part of the instruction in foreign languages is still according to the 'grammar method.' I judge from their inability to understand the easy spoken German of the class-room—the German of their lessons."

Evidently the actual results of our high school teaching seems pitifully small to the men higher up. They certainly seem small to parents and pupils.

We come now to ask what should be accomplished in the time devoted to the work. And that brings us face to face with fundamental considerations as to the purpose of such teaching. Why are we teaching these languages? It is clear that foreign languages should be taught in European countries. In Switzerland, they are "bread and butter" subjects. To get on at all well one must be something of a polyglot. In France, Germany, Norway and Italy, it is a distinct economic advantage to speak more than one language. But America is isolated. Abroad our travellers can get on well enough with English; at home there is little contact with foreign-speaking people. The average American will have little use for a modern language other than his own. Not one in a hundred, will ever need to converse in a foreign tongue. Few graduates of the high school ever read a French or German book, unless it be in a college course. With the multiplicity of libraries and the enormous number of books in English on every conceivable subject, to say nothing of the great variety of technical journals and periodical literature all pressing to engage the reader's attention whenever for a moment, he ceases to struggle with the high cost of living, it is not to be wondered at if the graduate falls from grace and abandons his high resolve made in school to keep up his languages.

Since this is so it is perhaps not to be wondered at that many modern language teachers are satisfied with the easier method. If the student learns to translate by means of grammar and vocabulary, they say, he will get valuable training in English expression. I, for one, object to making every subject in the curriculum subservient to English. We give English the first place. We make it the one always compulsory subject; we give five periods a week to it for four years; we foster it with school papers, speaking contests and debates. If, with all these advantages, English cannot yet stand on its own feet, it is time to cast the weak usurper out or send it back to the literary society from which it came. But I am satisfied that English can be made to carry its own burden; at any rate, the modern languages do not need to come to the rescue.

Those who advocate the grammar method have another argument. Latin and Greek, they say, are losing their hold. French and German using the same methods of translation and grammar drill should take the place of the ancient languages as disciplinary studies. We must ask: "Why are Latin and Greek losing their hold, if it is true that they are?" This is the answer one generally hears: Because they are *dead languages*; they are no longer heard and spoken. Just as soon as parents and pupils are advised of the fact that French and German are being taught as dead languages, just as soon as they become generally aware that after six or eight years of study in high schools and universities students are still unable to converse in them, just so soon will French and German cease to have a place in the public high schools. Taught as dead languages they cannot be compared in educative value with Latin and Greek.

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Rightly taught, the modern languages are especially valuable as school material because the young student gives himself so willingly and devotedly to the work. It is an interesting phenomenon of youth, this eagerness to extend its power by gaining command of foreign words. There is an age when, if given no chance at a real language, half the boys and girls will be trying to invent one of their own. It seems as if nature were on the side of the school master here. They take the efforts of the poorest teacher most seriously at first. If but there were no disillusionment, the disciplinary value of such work would be immense.

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The student of languages gains power of thought-analysis, quickness of comprehension, subtlety of discrimination. He gets a new point of view; for he learns to sympathize with the foreigner. That narrow provincialism which ridicules and despises as outlandish and barbarous all whose way of speaking, thinking, and doing are unlike one's own soon gives away to admiration and regard. In imagination, the boy becomes himself a young *Deutscher*, a young *Français*, as he speaks the language of the part. Teachers of foreign language are the true missionaries of the world. They are leaders by no means insignificant in the movement for international peace.

How fortunate for the secondary school to have in its curriculum studies at once so welcome to the student, and so valuable as culture and discipline! We have only to see to it that we do not disappoint the hopes of the student by diverting him from his interest in acquiring the living spoken language.

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At this point, some one surely wants to interrupt and say that in his opinion, the real object is not to give the pupils what they, perhaps, want; but what is most practical and best for them. In their immaturity, they cannot know what they want except in an instinctive way. Since the American student will have little use for the spoken language, let him by practise in translating, get a reading knowledge only, and so gain access to the great literatures of France and Germany.

This sounds reasonable; but the fact is, it is quite impossible to secure an adequate reading knowledge of any language unless that reading is based on hearing and speaking. Words as signs, printed words, become capable of conveying their full significance only because there is familiarity with the same words as sounds. This is especially true of all artistic writing. Literature is as much the product of sound as it is of sense. Only when sound and sense are blended in perfect harmony, do we take delight in the utterance and call it literature. Every language abounds in onomatopoeic words and phrases that reflect the thought in the sound. Then there is a flow to true literature, a movement now fast, now slow; now sonorous with vowel sounds, now labored and impeded with excess of consonants. This movement catches the spirit of the original utterance, betrays the mood in which it was said or written, and is a large part of the expression itself; for it induces in the reader the identical mood, and makes him understand more clearly because he actually feels what the writer felt and said. This complete understanding, this full appreciation of the author would, of course, be impossible in silent reading if it were not that printed words recall to memory the sound of the spoken words and even compel unconscious movement in the vocal chords. Some persons are hoarse after reading to themselves even when the lips have not been moving.

To appreciate literature by reading, one must have had careful phonetic training and considerable practice in hearing and speaking. What I am trying to express here can, perhaps, be made clearer by example. Take those lines of Coleridge to which someone has called attention. I know of no passage which in a few lines illustrates so well harmony of sound and sense.

"The lady sprang up suddenly,  
The lovely lady Christabel;  
It moaned as near as near could be,  
But what it was she could not tell;  
On the other side it seemed to be  
Of the huge broad breasted old oak tree."

Do you notice that the rapid movement of short vowels in the first line is in harmony with the thought—"sprang up suddenly"? Then observe how the liquid *l*'s of the next line bring out the charm and beauty of the young girl, and add a note of sympathy for her—"the lovely lady Christabel."

"It moaned as near as near could be,"—you hear and feel the very sound she heard. Those short simple words of the fourth and fifth lines bring out her child-like wonder; and in the last line, vowels buried in difficult consonant combinations slow up the movement to portray the tree's massiveness—"the huge broad breasted old oak tree."

This is, of course, very apparent in lyric poetry; but it is equally true of literary prose. Imagine a German with a broad accent reading Stevenson's *Will O' the Mill*—the phrasing improperly measured, the accents misplaced, the exquisite blend of sound and sense all lost to the ear. The spell of Stevenson would be lost; the charm broken. That indescribable world of feeling into which he lures us, would be gone. The foreigner, lacking our pronunciation, our feeling for the language, could not catch the full significance of such literature. In fact, it would not be literature to him. I fear that those high school teachers of translation who think they are imparting to their pupils an appreciation for the literature of Schiller or Molière are

sadly mistaken. If they would confine their efforts more to the linguistic side, perhaps the students who come to the university could appreciate the literature. I venture to say there is not a man in America who can read Vergil with anything approaching the emotional reaction which that poem produced in the mind of a Roman. It is the great thing in modern language study as contrasted with the ancient that we can through phonetic drill, through practise in speaking and hearing and acquaintance with "the life behind the language" actually arrive at this feeling for the language which admits at last of a full appreciation of its literature.

As for translation, we cannot depend upon the student's translation to reproduce what he cannot see when he reads the original. The subtle things of literature cannot be carried over into another language. At least it takes a literary artist to translate an artist; and he could not do it as our pupils do, depending merely on lexicon and grammar. He must himself, have acquired the *sprachegefühl*, the feeling for the language. As Armstrong of Johns Hopkins says: "Each people has its own sequence of ideas, its own stylistic forms, its own shadings of vocabulary. Attempts at literal rendering give only translations devoid of artistic qualities and incapable of renewing in the reader the impression the writer is seeking to transmit." Only when the student is able to read and understand the foreign language without the medium of English, is he able to translate with any considerable degree of fidelity and power. To the American student who has little opportunity to speak the foreign language outside the school room, the advice should be, "Read aloud, read aloud, read aloud." Read passages of which the meaning is clear without thought of an English equivalent. In the class room, more concert reading would help greatly, for all the pupils could then get more practise in speaking.

It is doubtful whether it pays to spend so much time, as some teachers do, correcting the speech of individual pupils; it only ties up their vocal chords by making them self-conscious. Gradually the skill will come as it does naturally to younger children. Notice the encouragement a young child gets. The mother sits with her babe at her knee and says:

"Baby, who you like the best?" And the child answers: "Me like 'oo dah bes'!" Imagine the mother correcting the child: "You mustn't say *me*; say *I*. Do not pronounce *you*, *oo*. *The* is not *dah*. The word is *bes*, not *bes*."

If she went at the child as we teachers do, it would certainly be very backward in learning to talk. But the moment the words are out, the mother clasps the speaker to her or tosses him on high with a cry of delight. It is not that we should treat our high school boys and girls as babies; but we should mete out plenty of encouragement, and accept poor attempts at first without much criticism, just to get them to trying. We learn to speak by speaking.

It is doubtful whether we can ever accomplish what should be accomplished in modern languages so long as the general school situation remains as it is, with eight years' work in primary schools and four in the high school. We do not catch our pupils young enough. If a language could be begun at the end of the sixth, rather than at the end of the eighth grade, that would be ideal. At that age, the language sense is most active and the memory most retentive. There is a high plateau of efficiency at the culmination of childhood, that two or three years before the mental and physical breakup of adolescence. That is the time to acquire the rudiments of a language, by the direct method. It can never be done so well after that. Those who begin a language in college begin too late to do anything more than translate in a fumbling fashion. Only a few at this age can ever really learn the language.

There is another serious flaw in the general scheme of education which interferes sadly with all language teaching in high schools, English as well as the rest. It is due to the fact that few grade teachers have had training in a foreign language. We must depend upon the grade teacher for English grammar. In the majority of cases, the grade teacher cannot teach grammar. She teaches such terms as objective case, attribute complement, which, though well-known constructions, will never be known by the names she gives in any higher institutions except perhaps, the normal school. Not having had any training in a foreign language, she is, of course, unable to recognize English idioms as such, and often fails to discriminate ordinary constructions such as the infinite in *ing* and after auxiliary verbs. As a result the teacher of foreign language must carry almost the whole burden of English grammar along

with the foreign. I asked the teacher of German in a neighboring high school, whether she found the lack of a good knowledge of English grammar a serious drawback to those learning German grammar.

"No," she replied, "I explain the English first. Today when they didn't know why a direct object is in the accusative, I made every member of the class repeat the rule after me." Now the direct object is in the accusative in every language. Why should we not expect pupils to know this when they come to us?

The failure of grammarians to get together and agree upon a common terminology, is one of the most serious wastes in education. This might be remedied in some part if normal schools taught the languages so that teachers of English grammar could anticipate high school needs.

In closing I want to make a confession. I myself, have been guilty of teaching a modern language by the translation method. I taught French, though I had never seen the country, could not converse in French, could not pronounce accurately, and knew little of the French life. I should have been suppressed, incarcerated. That was more than twelve years ago. What I did no one will ever be allowed to do under my supervision.

Now I want to tell you about a real modern language teacher whose work I have observed for the past ten years. She is the best paid woman teacher in our school—modern language teachers should be the best paid teachers in every school. It takes money to get the training they need. This teacher gave up an excellent position in Oak Park to spend two years in Berlin before coming to us. She has taken private lessons in Chicago, whenever she could hear of a first-class teacher. She has put up with inconveniences in order to board in a German family of culture; she has gone to university summer schools or abroad almost every summer. She heard of a great teacher of phonetics in Berlin, and obtaining a five weeks' leave of absence one summer, she crossed the water to spend four months under the tutelage of this inspiring teacher.

One hears very little English in any of her classes, practically none in the final year. It is as necessary for the pupil to learn German in her class as it is for the foreign maid to learn English in an English-speaking home, only her pupils have the advantage in a more scientific presentation of grammar and pronunciation, than the maid would get. The pupils are put on their mettle, their curiosity is stimulated by hearing words that they do not understand. When they meet such words they remember them.

"What does *schnell* mean?" I asked of a first year boy from the German class.

"I have heard the teacher say it to us several times," he replied, "but she hasn't yet told us what it means."

There is a real motive for acquiring vocabularies in her class. The pupil cannot get on without them. In translating one might look up the same word in the vocabulary twenty times without learning it; but there is no chance to lean on that crutch when the word must be used and understood in the interchange of living speech. One hears no set translations word for word. Here and there a word is called for *auf English*; but usually a German synonym, an illustrative sentence, or a different application of the word discloses its meaning when in doubt. The class reads the German. No English equivalent gets between them and the object of thought. There is much *freie reproduction*, German paraphrases of the text made in answer to skilful questioning. These paraphrases tell whether the passage is understood and emphasize the significance of the German while they call for slight changes in construction that give constant drill in the technique of the grammar. German grammar is by no means neglected, only it does not stay in the book. It passes just as fast as possible into the backbone or whatever region holds the subconscious.

The class work is stimulated by *der Deutsche Klub* which meets after school fortnightly. Here, some little German play or dialogue is acted out; the stereopticon throws postal pictures of German scenes on the wall; interesting letters from German correspondents are read, for each pupil keeps up a correspondence with some student of English in a German school. Meanwhile, all talk must be in German.

Every time a member of the *Klub* forgets or fails to speak *auf Deutsch*, he must pay a penny. These pennies buy German cakes and other characteristic goodies on which *der Deutsche Klub* regales itself.

Her pupils who enter college tell me every year of passing examinations for advanced credit or of finding the work easy. One of them entered Northwestern after two years of alternate failing and passing in the class. Now Northwestern uses the grammar method and Assistant Professor Curme is expected to recommend that method to high schools in an address at the next session of the Modern Language Association. I considered it a tribute to the direct method when this doubtful student said: "I hesitated about going on with German. I had made such a fizzle of it in the high school. But, do you know, I'm about as good as any of them." Professor Goebel tells me that one of the best students he has had at Illinois came from this teacher.

We have seen that the prevalent system still makes much of translation into English and that the results are not satisfactory. We are now ready to answer the third question asked at the beginning of this paper: "What results ought to be secured?" Since very many students for one reason or another take but a single year of German in the high school, it seems best to tell what should be expected at the end of the first year. As the result of one year of German the student should and can have (1st) a thorough knowledge of the important principles of German grammar including the declensions, conjugations, and use of modal auxiliaries; (2d) the ability to give from memory many passages of connected German with fairly good accent, and to give back in short, idiomatic sentences what he has just read in German.

As the result of two years of German, a high school student should be able to read and understand more difficult German without thought of an English equivalent; to follow and understand a German talk or a story told in German; and finally to be able to tell a story in German with no undue hesitancy, and with an accent that is not offensive to German ears.

At the end of the third year, the student should be able to read a German newspaper and all ordinary prose at sight and to follow a lecture in German. At this time, he should begin to catch the spirit and beauty of German literature as an artistic creation. In my experience, a student taught by the direct method is actually able to do what I have here briefly outlined at the end of each year.

To sum up and answer the original question, does the prevalent system of instruction in modern languages, secure the results that should be accomplished in the time devoted to the courses, our answer is: "No, it does not: (1st) because the wrong method is generally used; (2d) because the work is begun at the wrong time in the life of the student; and (3d) because English grammar, which might in a large measure, prepare for the grammar of other languages, is inadequately taught and its terminology is all out of joint with the terminology of other languages.

The paper read by President Nollen is given in full, as follows:

#### The Value of Literary German.

Just thirty years ago there appeared in Germany, under the suggestive pseudonym, "Quousque tandem," a little pamphlet bearing the revolutionary title, "Der Sprachunterricht muss umkehren!" It created a sensation by its spirited attack upon the good old grammatical method of teaching modern languages, by its unsparring exposure of the practical absurdities of the text-books and the pedagogy of the German schools in this field of education. To illustrate these absurdities, the author (Wilhelm Viëtor) quoted with approving relish, Brassai's parody on the methods of language teachers: "How would a carpenter teach an apprentice his trade, by the Donatist method? On this wise: He would first exhibit, as samples, shavings of the various kinds of wood used in his craft, and would count these and classify them according to their density, color, and texture. Then he would introduce him to the tools, carefully classifying these as (1) wooden (planing bench, vise), (2) made of steel and wood, and these subdivided into (a) cutting tools (saw, plane, chisel) and (b) piercing tools (augur, awl). The pupil would learn the theory of all these appliances and become fluent in rehearsing all their names, parts, classes and uses: all this

without ever actually using saw or plane or augur, without any practical application of his fine theoretical knowledge."

Since Viëtor's polemic pamphlet began its good work of agitation, things have changed mightily in the German schools, which today, exemplify the most up-to-date and the most successful teaching of foreign languages. We have had distant echoes here of the commotion that accomplished this pedagogical reform in Germany, and, conservative though we have always been in such matters, our own practise has not been unaffected by the German reform movement. We have learned to say that the living present has greater claims upon us than the petrified past, that the vital spirit has more to say to us than the dead letter. The real word is not the vocable that is neatly laid out in the great morgue which we call a dictionary; the real word is the spoken word, the living phrase that glides from lips moving under the impulse of communication. The language lives in the dialect of the present, and we are all working unconsciously, incessantly at the weaving of this living garment of thought. The teacher of a modern language should be saturated with the vital idiom, and inasmuch as the word or the phrase is essentially a succession of sounds, the teacher should be an expert in the science of phonology, which tells what the nature of these sounds is and how they are produced. The student must learn to use his vocal organs in the making of the right sounds and to put these sounds together in speech before he learns to decipher written texts or to recognize the grammatical structure of the language. Phonetics first, and phonetics ought to begin in the nursery. "The time will come," says Sweet, "when ignorance of practical phonetics will be held to disqualify a nurse as much as any other form of incapacity." Of course reading must begin with texts in a scientific phonetic notation. Exercise writing, or the old form of "composition" in the foreign language, must be abolished and oral exercises must precede any attempts at written reproduction of what has been learned. Grammatical knowledge must grow out of actual acquaintance with the language as spoken and written, and paradigms and tabulations must be merely summings up of what has already been learned indirectly and more or less unconsciously. The reading of the literature, especially of older periods comes at the end of the process. These are the main articles of the "reform" creed. The result of the process is intended to be a thorough knowledge of the language, which implies "speaking with moderate fluency and sufficient command of the grammatical structure of the language to avoid grammatical errors, a knowledge of the necessary idioms, and being able to write a letter and read the literature." This result has been measurably attained in the foreign language courses of the "reform" schools of Germany, where good teaching and a liberal allowance of time in the curriculum have conspired toward efficiency.

Modern language teaching in the United States is in general less efficient than it is in Germany, because our teachers are usually not so well trained for their work and our courses are much shorter, or at least inferior in consecutive length. It stands to reason that a two years' course in German under a teacher with an imperfect command of the language and without phonetic or pedagogical training is a different thing by far from a four or six years' course under a master who is completely equipped for his work. Indeed, the difference is fundamental.

Of course we ought to work earnestly at the reform of educational conditions, so that we shall not forever need to contend with the heavy double handicap that now weighs upon us. We need to labor incessantly to make teaching a true profession, implying a complete professional equipment and bringing the rewards that are due for expert service. But meanwhile, we must go on living and teaching as best we can, in the wisdom that comes with a consciousness of our limitations. Life is short, and the high school course is very short, and the subjects of the curriculum are many, and classes are often large. What is the most profitable use we can make of the brief time allotted to the teaching of German?

At the risk of appearing a reactionary and an old fogey in these days of progressive enthusiasm, I answer, by whatever method we may proceed, and whatever else we may do, we must teach our pupils to read German. That is the paramount duty of the American teachers of American boys and girls who are getting ready to live as grown-up people in the United States.

May I begin afresh with a criticism at one important point of the attitude assumed by the phonetic reformers. There is a certain exaggeration and falsification in exalting the spoken word as the only true and living form of expression, in treating the written word as a lifeless fossil. After all, the sounds that make up speech are not an end in themselves, they are merely symbols of perception or thought or emotion, a convenient vehicle of expression. In this respect the spoken and the written word are on the same basis; both are equally symbols, one usually as arbitrary as the other. There is no more inherent and necessary connection between the real object and the sounds, "tree, arbre, Baum" than between the objects and the written characters that spell these names; a picture of a tree, no matter how rude, would be a more direct symbol than either—more direct, but not better, for the sound-symbol and the print-symbol have great advantages of practical convenience.

Naturally, the sound-symbol existed ages before the written symbol was invented. But as civilization has made progress, the written symbol, has, relatively, gained vastly in significance and value. It has the inestimable advantage of permanence. In Victor Hugo's "Notre-Dame de Paris," there is a chapter-title "*Ceci tuera cela*," which is interpreted as meaning, "the book will kill the building," or "printing will supplant architecture." The idea is ingenious and in the main correct; architecture as a living and developing means of expression is as good as dead already, and the eloquence of the temple or the place has given way to the more mobile, succinct and economical, and we may add even more lasting, expression of the word. But it is the printed book that has won this notable victory. The increasing extent and complexity of the inheritance of the ages demanded a form of record permanent and compact, adapted to storage and easy reference. For this purpose, the written and printed word is incomparably superior to spoken tradition. The sum of the achievements of our civilization is expressed in books, not in speeches, and we have perforce become more and more eye-minded rather than ear-minded, as we have been compelled to resort to books for our guidance. Oratory has a relatively low valuation; writing and reading are at a premium. Literacy is our present day test of intelligence; in the middle ages, this test would have been valueless, because even many a great poet in those days, could neither read nor write. Nowadays, only uneducated people are more voluble than pen-expressive. Compare your own conversational vocabulary with your written vocabulary, and you will likely find that the latter is by far, the more extensive.

Perhaps it is fair to say further that while the written word is more apt to the expression of thought, the spoken word is more apt to the expression of emotion. There are emotional sounds that defy transliteration, and complicated thought-words that are virtually unspeakable—so the sesquipedalian compound names of certain complex chemical substances. Poetry is best interpreted by the voice, philosophy or scientific fact by the printed page. Fancy reading aloud Kants' "*Critique of Pure Reason*!" On the other hand, it is difficult to read silently Goethe's "*Über allen Gipfeln ist Ruh*,"—the words irresistibly break into rhythmic speech. But this distinction, while real and important, has little value in our present discussion; for even the poetry, the drama, the oratory of the world's literature are preserved for us and conveyed to us by the printed page. The conditions are such that for ninety-nine hundredths of the content of our culture we are indebted to printed records.

If the facts are as I have stated them, it follows inevitably that in these days, learning to read a language is the irreducible minimum of cultivation in the language. Other objects of instruction, however important, are secondary to this universal requirement. These other objects have a relative value that varies widely. In European countries, ability to speak and to write other European languages, has a great practical value because very many people will have occasion to make use of this ability in their contact with foreigners. For inhabitants of the United States, the power to speak or write a foreign language, has a far lower value, because a very small proportion of them ever have any opportunity for the useful exercise of this power. It is probably fair to say that the commercial and diplomatic or social value of the European languages for us is no greater than the similar values of the Oriental languages for the European. So far as these values alone are involved, the problem concerns only specialists, not the general educational interests of the country. For

us, in general, practise in speaking and writing has only phonetic and grammatical importance, in giving students a better knowledge of the sound-values and of the structure of the language; in a word, *Sprachgefühl*.

We are now at a point where we may boldly assert that the so-called "practical" objects commonly urged for the teaching of modern languages may be practically eliminated from our consideration as teachers of these languages. We are at liberty to look at the whole matter in the broadest way as an educational problem. We need only ask ourselves how, as modern language teachers, we can best contribute to the cultivation of the minds and spirits of our pupils. We should undoubtedly contribute a good deal if we should teach them about the history and the present-day life of Germany, its political and social institutions, its philosophy, its art, its industrial development. These things, however, really belong to other departments of instruction, and we can give our students only chance glimpses of them. But we, and we alone, can give them the key to all these great treasures of human interest, by teaching them the language of the books in which these treasures are stored up. Above all, we and we alone, can introduce them directly to German literature, which is the expression of all that is essential and abiding in the thought and the spirit of the German people. For that is just what literature is—the mobile and vital architecture of a nation, the substance and form of its inner life.

And this leads me to criticize another tendency of the "reform" pedagogy, the tendency to limit the reading of the first years to contemporary authors. There can be no objection to this so long as the purpose is through the reading to re-enforce the students, familiarity with the present-day vernacular. But if we admit the paramount importance for our students of a knowledge of German literature, then we must not keep them too long on an exclusive diet of late nineteenth or twentieth century writing. The great bulk of the best writing in the German language, the greatest wealth of permanently valuable content, lies well back in the past. The American student will profit far more by the reading of dramas by Lessing, Goethe, Schiller, Kleist, Grillparzer, than by reading Hauptman, Sudermann, or Otto Ernst; he will gain a far better insight into the lyric heart of Germany by studying the poetry of the Romantic period than by making the acquaintance of Dehmel and Stefan George. For the American student the passing literary mode of the immediate present in Germany has comparatively slight interest or value, whereas the works that have become the literary monuments of the nation are essential to the rounded development of a cultivated mind. The objection often made that the student is thus familiarized with forms of expression that are more or less archaic, has little force for us; for the thing we are aiming at is not to make our students familiar with the present-day vernacular, much less to teach them the particular dialect of Berlin, or Vienna or Hanover; our object is to introduce them to the great literature of Germany. To illustrate the point by exaggerating it, we would surely rather give a young foreigner the key to the imaginative world of Shakespeare, than to teach him a good imitation of the Cockney accent, and make him fluent in the current slang of 1912.

Let us recapitulate briefly:

The language of books is just as truly a language as the language of speech. It is in books that the values of any national civilization are in these days principally expressed. These ideal values are far more important and enduring than the real values attached to spoken intercourse. This is particularly true for American students, few of whom will have occasion for the practical use of a foreign language. For us, therefore, the great object must remain to teach our pupils to read the foreign languages. Any method that accomplishes this result quickly, is for us a good method. If this method succeeds at the same time in giving the student a good pronunciation and some facility in speaking and understanding the spoken language, so much the better. If it succeeds in introducing the student directly to some of the masterpieces of the foreign literature and giving him the power and the inclination to delve farther into the riches of this literature, that will be best of all. We shall receive gratefully all the guidance and all the inspiration that the enthusiastic reformers of our pedagogical methods can give us; we shall resolve as teachers to get the best training that is to be had for our work, to become experts in our calling;

and amid all the discussions and all the movements, we shall keep steadily in view the high educational objects of our contribution to the cultivation of the mind and heart of the future citizens of our country.

### MUSIC SECTION.

The Music Section was called to order at nine o'clock by Mrs. Constance Barlow-Smith, who extended a hearty welcome to the members of the Conference, expressing a keen sense of pleasure and appreciation of the fact that the gathering was so representative of the department of music in the secondary schools in the state. The origin of the Music Section was touched upon as being a direct result of many inquiries from supervisors, principals and superintendents with regard to university entrance credits for music. A committee was appointed two years ago for the purpose of making an investigation of conditions, the result of which was contained in the report submitted to the Music Section of the Illinois High School Conference last year. Mrs. Smith urged a cheerful perusal of the proposed courses of study which had been distributed, as they would be voted upon later. She stated that these courses had been carefully planned by the committee that was elected a year ago for that purpose and that the report would be discussed at the proper time with a view to adopting unified courses that would be worthy of credit.

The minutes of the last meeting were read, including the report of the committee for investigation of conditions as existing in the teaching of music in the high schools.

Miss Clara I. Dailey, Supervisor of Music from Peoria, Illinois, was introduced and read a paper on "What an Appreciation Course in Music Means."

"Much is vague and nebulous about the high school period, both from the teachers' and students' point of view. The student uses his inexperienced critical faculties constantly to the detriment of his creative and reasoning powers, therefore, the teacher finds it a difficult problem to help the boy and girl to discover a sensible basis for criticism and how to apply it.

A course in musical appreciation obviously aids in developing discrimination, and the power to judge. In this brief paper, I shall try to show what can be accomplished in the average high school under favorable conditions and avoid the intangible "what should be done."

Musical appreciation, properly taught, accomplishes three things. It provides for the social hour; develops the intellect; and establishes taste, which added to acquired skill, gives discrimination and conscious power. Unison and part singing brings a class together at regular periods to take part in a common performance, the very nature of which tends to develop fellowship and human understanding; school and class spirit is fostered, and the community reaps the benefit. In Peoria, some of the graduates of the last two years and a few of those who hope to graduate from the high schools this year have formed a club for the purpose of continuing appreciation work in music.

It is evident that music appeals to a much larger per cent of the boys and girls in the high school than does any other subject. Especially is it noticeable since the

work of the chorus hour has broadened into appreciation avenues. Credits being allowed for the work has caused more students to elect it than ever before. Our students have become so interested in listening to good music that they have earned the purchase price of a Victor machine. A musical appreciation course must, of necessity, include the hearing of the best vocal and instrumental selections that can be secured through local and visiting artists, when it is possible to secure a low charge for the class. One excellent opportunity that is being presented through Mr. Thompson of Joliet, is an artist recital by Marcus Kellerman, the well known baritone; a plan is offered wherein the students from the high schools can attend the concert for ten cents, while adults pay a dollar a ticket. This is an educational movement, and is meeting with success. We have engaged Mr. Kellerman for the evening of December the eleventh, and hope to fill the house.

Peoria boasts of a most progressive "Amateur Musical Club" of seven hundred members. This club has become interested in public school music, and an effort is being made by its representatives to assist me in securing credit for outside music work, that is done under competent teachers.

In the exercise of singing standard choruses, and hearing good music as well as in acquiring the knowledge of form, the talented student is perhaps, preparing for his or her vocation in life, either as a performer or as a teacher.

Blockading rural influences and prejudices toward artistic development is a great trial to the "down state" supervisor, and it is earnestly hoped that this sort of impediment may soon disappear in the interests of not only the specially skilled boy and girl, but music education for all who have talent enough to grasp the subject, while they are passing through the high school."

The paper was well received and ten minutes allowed for discussion. Mrs. Smith commended the work of the Peoria Amateur Musical Club, mentioned by Miss Dailey, and expressed appreciation of the assistance that was being given to her by this influential organization.

As chairman of the Music Committee of the State Federation of Women's Clubs, Mrs. Smith made the statement that the music departments in the clubs were pledged as a major effort to help to bring about standardization of music in the high schools, and that the supervisors should enlist this interest in their own localities if necessary. The discussion became quite general.

The testimony of each speaker seemed to justify the conclusion that adequate time was not allowed for the subject of music appreciation in most of the schools.

The chairman next announced that Mr. W. Otto Miessner, Supervisor of Music from Oak Park, was so well known as a practical theorist, and the writer of beautiful songs that it was scarcely necessary to introduce him to an audience of supervisors of music, but that it was a pleasure to welcome him as a co-worker in this movement for standardization. Mr. Miessner read an able paper upon "Musical Theory in the High School," using the blackboard and the piano to illustrate points in song writing and chord progressions.

Mr. Miessner spoke, in substance as follows: "

Music is a language; a vehicle for thought utterance. More than this, it is a universal language; the common inheritance of man, with the same symbols in use throughout the civilized world. It is as varied in its form as is its environment; as barbaric, or as refined as the civilization which produces it.

In its highest and grandest forms, we find it developed only among civilized, intelligent and refined people. Among these it is fully appreciated only by the chosen few; by those to whom the musical thought-content is intelligible. For music, like a word language, makes it appeal to the emotions through the intellect. One must hear understandingly in music, just the same as in French, in order to grasp or to appreciate the full import of the thought which has been given utterance.

The simple folk songs and folk dances of the people are readily appreciated by the people; they are born of the people, the offspring of their emotional natures, and as such, they need no elucidation; no more so than do the jingles of Old Mother Goose. But who will affirm that Milton, Dante, Shakespeare or Browning are

equally as intelligible to us without special training in grammar, syntax, rhetoric, composition and style, together with a knowledge of history, of mythology and other kindred subjects?

In the music of Bach, Haydn, Mozart, Beethoven or Wagner, we find the same complex organization and development of thematic material as is found in the master-works of the great literary geniuses, and an intelligent appreciation of their greater works is to be had only at the expense of a similar specific training.

It seems the psychological moment for the agitation of a national movement for definite courses of musical instruction in our grades and high schools, and that, when such instruction is offered, the students who are eligible to such courses by natural endowment and inclination, should be given credit for such work on a basis of equal merit, hour for hour, with any other study. This plan would make possible the attendance at high school for four years, of many talented musical students who otherwise would either be obliged to drop their music, or their high school, or try to do both—which is, to say the least, unfair.

From the standpoint of vocational value, I am secretly hoping to see the day when our larger high schools will offer courses in piano playing, orchestral instruments and artistic singing. Our graded schools employ three manual training, three domestic science teachers, and one drawing supervisor. Our high school employs five manual training, two physical training, and two art teachers, and will next year, materially increase this force. If the statement that "there is no other art in whose practise so large a portion of society participates" is true, then it is time that music should come into its own.

From the standpoint of cultural value, there is need for definite instruction in the science or theory of music. The necessary song experience upon which to base a theory of music, must have been given the students while attending the graded schools, and this theory work must be a logical development of this song experience into a scientific knowledge.

As early as the second grade, the children have become familiar with the tonic triad "do-mi-so" as it occurs in melody. In the sixth grade they have had daily experience with the tonic chord "do-mi-so." Indeed, they will have discovered (if carefully guided) that the effect of the chords on the first, fourth and fifth degrees, is a similar effect, i.e., that these are major chords, and that the effect of the chords on the second, third and sixth degrees is a similar effect, and that these are the minor chords of the key. All of this has been accomplished through the observation of concrete song material with the sole aim (at the time) of developing more intelligent and more musical song singing and sight reading.

The conscious observation of repetition, imitation, and contrast between motifs, phrases, sections and periods has been a help to the sight reading, to memorization and to intelligent listening. In the high school this knowledge of form is to be applied analytically in the study of works of the masters, and synthetically in the construction of simple melodies after given models.

Analytically, the folk-song experience is carried over into the study of two and three part instrumental dance forms, classic and modern. The combination of these into suites or cycles, and the development of the operatic overture, and of the suite into more closely unified forms known as the rondo and sonata forms, will prove interesting and be of positive value in intelligent listening, and will be indispensable in original work. In harmony, what was in the grades a more or less superficial observation of the combination of tones as they formed pleasing effects, is now found to be a highly organized science with laws as fixed as those of mathematics.

However, if harmony is to be made interesting to high school students, it must be made a *live* topic. The material used must be *concrete*; it must express something definite in the way of a musical idea. In order to express musical thought, the harmonic material must be used rhythmically. Rhythm is the living pulsating body, melody the beauty of form and figure, harmony the garb or dress in which it is clothed. Without rhythm, melody is dead.

Why is musical theory the horror of all musical students? Because the text books still present it through the obsolete figured-bass methods of mediæval times. Mere chord-connection will not interest a high-school lad, and I do not blame him, for most theorists treat music as if it were a dead language. What we want,

is a text book full of concrete and beautiful examples, to illustrate each chord, even when the harmonic material consists of but the tonic chord. Even Wagner was sometimes satisfied to use so little in expressing much. (Note introduction to Rheingold.)

One fact, *one chord* at a time, must be presented and related to the past experience of the student; new and interesting illustrations must be played, heard, analyzed. Later the student's own creative effort must be stimulated and set to work in self expression, guided by familiar models. Each fact must be used by the student in expressing himself, before we can be sure that it is his own.

For instance, the tonic triad, long familiar as "do-mi-so" in melody, must now be presented as the tonic chord of a major key. C-E-G becomes the model tonic chord. From the specific fact we work towards the general fact of tonic chord in any major key, and through a closer analysis to the like character and relationship of the major chords of the tonic, subdominant and dominant of the keys. Its inversions in close and open positions should be worked out at the keyboard, played and sung by the class, recited and written out in alphabetical order and in notation.

New and interesting illustrations of the use of this chord in actual compositions, should be introduced for analysis and played for the class. Later they should invent two or four measure melodic phrases following the line of this chord and add the other tones of the chord below the melody with a repeated bass. If the melody is transferred to the bass with repeated harmonies accompanying it, the problem of inverted basses is solved immediately and in an interesting manner. Give the class familiar jingles to which they may make first a rhythmic sketch, after deciding upon the most obvious scansion, later adding the melody and harmonic accompaniment. After the specific idea has been made generally by transposing this tonic chord material into several new keys, we may proceed to the chord of next importance, namely the dominant, and treat it in the same exhaustive manner. We next proceed to the principles of chord connection, by connecting these two chords in their various inversions, close and open positions, by retaining the common tone in the same voice part. Again we must teach concretely and analytically by having the students play examples from songs or instrumental compositions, which will introduce the authentic and half cadence. Later we may add the sub-dominant chord and its connection with the tonic which introduces the plagal cadence. In connecting tonic and dominant or tonic and sub-dominant, we have Rule I: "Retain the common tone in the same voice." In progression from sub-dominant to dominant or vice versa, we must be guided by Rule II also positive: "When there is no common tone, let the bass move in contrary motion with the treble or upper voices."

Passing tones between these primary chords should be taken up at once instead of being postponed for months. They occur in the simplest folk songs with the simplest harmonic background of tonic and dominant. Harmonization in minor may be begun almost simultaneously with the introduction of these primary chords (cadence harmonies) in major, after a comparison of the minor with the major scales. Later, we will introduce the relative minor chord of each major chord in the key, and the proper connection of each chord with every other chord according to the two positive rules quoted above. Later still, the character and proper use of the chord or triad built on the leading tone, making use of each new bit of material added as suggested for the tonic and dominant harmonies.

Then will follow logically, the dominant seventh, the secondary sevenths, the dominant ninth, augmented and diminished triads, augmented sixth chords, suspensions, appoggiaturas, organ point, and so on. Simple modulations to the nearly related keys, should be so introduced soon after the presentation of the three major and three minor chords in the key. This is best effected through the dominant-seventh chord because of its absolute character, occurring, as it does, in but one key.

Along with the development of simple form in constructive melodic invention and harmonization, the students should analyze examples of more complex forms as illustrated by the choruses sung by the school, by instrumental compositions as played by the instrumental students of the class, or by the school orchestra, or by the Victrola or Piano Player. Progressive work of this kind and repetition of experiences in listening to models from the classic and romantic composers, will

develop good taste and intelligent discrimination in listening to music, and will provide models for original work, provided students have ideas which may be developed.

Where possible, the student should be acquainted with the characteristic tone quality of the various orchestral instruments. The Victor catalog contains four new interesting records of all the orchestral instruments, which are designed for this purpose. They should also be trained in recognizing, at hearing, the various styles of instrumental compositions in the smaller forms, such as the Old Classic dances, menuet, gavotte, pavne, sarabande, gigue, modern classic dances, waltz, mazurka, polonaise, bolero, march, romantic instrumental forms, and in the literature of vocal compositions to be familiar with concrete illustrations of folk songs, ballads, art songs, arias and recitatives.

To sum up briefly, this theoretical course consisting of harmony and musical form studied hand in hand, is to the development of an intelligent appreciation of the musical language, what grammar and rhetoric are to the intelligent command of a word language. Harmony is its orthography and its grammar, form its rhetoric and its style. Says Ruskin: "Art is man's disciplined delight in the forms and operations of the laws of the universe of which we form a part." It is only through an intimate knowledge of material and structural designs used by the artists that we can gain an intelligent conception and appreciation of an artwork. Our young people can hope to gain this knowledge only through intelligent teaching of a very definite sort.

It is earnestly to be hoped and desired that intelligent teachers and intelligent teaching will answer the call of the coming generations; for these are to be the music lovers of the future; upon this army of intelligent music lovers depends the musical future of the nation; and from among this army of music lovers, there will arise musical prophets, the great composers who shall be inspired by the demand for good music, to their greatest and noblest creative efforts.

The discussion that ensued demonstrated how closely the speaker had been followed in the presentation of his subject. Many of the teachers present participated.

Professor G. F. Schwartz of the School of Music in the University said that there seemed to be a tendency to attempt to cover too much ground in harmony and that he would suggest that the work be restricted to that which could be done well.

Director C. H. Mills assured the members of the Section that the School of Music was in hearty sympathy with the important work at hand and that every assistance would be given within the jurisdiction of his office. He further urged that the earlier musical education of children be as thorough and well founded as possible for then they should enter the high school with a basic knowledge of music as a foundation for the broader work that can and is to be done in the high schools of the future.

The report of the Committee on the standardization of music courses for high schools was read by Miss Sallie J. McCall, Secretary.

This report was as follows:

### Report of Committee on High School Courses in Music.

- I. All study of music, or exercises in music, undertaken by any high school as part of the scholastic routine shall be credited by that school.
- II. The amount of credit so granted shall be equal in every case, hour for hour, to that granted by the same school for any other subject; recognizing the well established custom of allowing double the credit for work requiring outside preparation as compared with credit given for recitation time only. In the following subjects, harmony and musical appreciation, both require preparatory study and can be easily certified and therefore should each receive double the credit, recitation hour for hour, of the credit given for work requiring no outside preparation.
- III. We submit these following as desirable and practical courses in music for the high schools of Illinois, a part or all of which may be selected for use in the different schools as conditions therein seem best suited.
  1. Musical appreciation.
  2. Harmony.
  3. Orchestra.
  4. Band
  5. Boys' Glee Club.
  6. Girls' Glee Club.
- A. Musical appreciation, based upon the standard choruses and instrumental selections from the works of the great composers of each epoch, to include contributory study, added instruction in theory, sight-singing, ear-training, musical forms, and construction of lyric melody. Two and three period song forms, opera, oratorio, instrumental forms, early dances, the suite, rondo, sonata, the symphony and modern composition. Analysis and musical history. The subject to be on the following basis of time and credits:
  1. A minimum of two periods per week for two years with double credits because of required and proved preparation, or
  2. A minimum of two periods per week for two years with single credits without required outside preparation.
- B. Harmony.
  1. First Year.
    - a. Elements of musical notation; construction of major and minor scales; keys; signature; intervals, general

and specific; key relationships; consonances and dissonances; triads; primary and secondary inversions of triads; chord progressions; simple melodies harmonized with dominant and sub-dominant harmonies; harmonic analysis; original work.

2. Second Year.

Review of triads; seventh chords, primary and secondary; non-harmonic tones; chromatic chords; sequences, melodic and harmonic; diatonic modulations; harmonic analysis; original work.

3. Double and single credits the same as for course in musical appreciation.

C. Orchestra.

1. A minimum of one double-length period per week for any number of semesters with single credits.

D. Band.

1. Time and credits as for orchestra.

E. Girls' Glee Club.

1. Time and credits as for orchestra.

F. Boys' Glee Club.

1. Time and credits as for orchestra.

(Signed)

Sallie J. McCall, Urbana.

Margaret Salisbury Hill, Chicago.

Grace V. Swan, Streator.

M. L. Test, Mt. Sterling.

H. J. Alvis, East St. Louis.

C. E. Lawyer, Aurora.

Constance Barlow-Smith, Chairman.

A brief discussion ensued, after which announcements were made and the session adjourned until two o'clock.

At one o'clock an informal Victrola concert was given to visiting supervisors.

The afternoon session was called to order promptly at two o'clock by the Chairman. Principal C. E. Lawyer was introduced as a "practical observer of conditions as to music teaching in high schools, as a member of the committee that made the report this morning, and as a non-musician." Mr. Lawyer is a great lover of music and from a principal's view point addressed the members of the Music Section upon "The Value of Music Courses in the High School."

A copy of his paper follows:

One of the most peculiar traits in our American school system is its tendency to get its stimulus from without rather than from within. Its conservatism has been as marked as that of anybody or organization known in history. Critics have said that instead of being the source of needed things in the economy of social welfare, it has been nothing other than a clearing house for the ideas of those influential pathfinders not directly connected with the system. It is not a tribute to those in charge of educational affairs to state that the changes which have occurred in the varied degrees of emphasis placed upon the branches or parts of the educational plant have been evolved and instituted by those who have been in touch with the public pulse, and who have felt the throb of community activity.

The early advent of music into the curricula of the New England public schools, was brought about by the insistent demand of a church going folk for a better training of its young people in that thing regarded by them as being essential. Economic changes have brought its consequent changes in community life and local demands have framed the courses of study accordingly. An unprecedented growth along commercial lines everywhere, has placed the emphasis upon the production of commodities; the high cost of living has made it appear that every one be taught those things most necessary in the securing of a large reward for his toil. The original idea of culture has been lost sight of, and the shibboleth of those appearing for graduation has been the one word, efficiency. This word upon whose syllables so many changes have been rung has not included much that makes for citizenship; not much that counts for happiness of the individual or for others; but has undertaken to answer the Napoleonic question of what can you do? Moreover, it has limited its answer to that form of accomplishment that can be most readily changed into that which will purchase the necessities, or luxuries of life.

One of the natural results of this has developed a people who are dependent upon visual thrills for their entertainment; who care little for the emotions coming from within and who are unfortunately and therefore not good company for themselves or others.

In the development of the economic independence of the individual, we have made him as dependent as a child for his entertainment. As soon as he emerges from under the curfew ordinance we find him upon the street, in the cheap shows, in the questionable resorts and almost anywhere but at home. As a boy recently said to me: "You can stay at home when you can't go anywhere."

This feeling, so common among our young people, and all too common among those of more mature years has militated against the solidarity of the home and has, I believe, added quite materially to the already over-worked judiciary. The court records of ever increasing cases of delinquency and marital unhappiness, show a failure upon the part of modern education to contribute to that most important element in our national safety, the American home.

We are hearing so much these days about "social centers" and this is a hopeful sign, yet the real center and foundation of permanent social organization is the home. When all the members of the family are able to read music and can appreciate the best there is in music, then the home will receive its own and our young people will find enjoyment therein. It is a matter of regret that music has been superseded by some of the so-called fads in education or by those things deemed more necessary from the producer's point of view. Some have thought it a plaything of the aristocratic and belonging to the list of luxuries outside the pale of high school requirements, or those of a liberal education. Our better colleges and universities have very recently come to the conclusion that a knowledge of music plays a very important part in developing the imagination, in teaching an exact science, in making the child a strong factor in civilization and uplifting his whole spiritual equipment. It is pretty generally agreed that it is our strongest social cement and has a greater influence for unity of effort than has any other branch of learning. Granting those things are true there is only one explanation why music has thus long been regarded as a minor in the high school course of study. This explanation seems to be dependent upon two things; first, its study did not contribute toward the individual's earning power, and, second, credit was not offered upon entrance to college. For

these two reasons, music has been too often the vehicle whereby display has been made or as contributing to the door receipts. The type of music taught for these occasions has been perfunctory and parrot-like, and many of our pupils have indulged in these song-fests who were without a working knowledge of music.

All of us must admit that the teaching of music as a part of secondary education, has never been taken seriously. Why it should be longer delayed seems to admit of no argument. It is older than any of the several languages taught in our high schools, and more general than all taken together. It is the universal tongue. It is more subtle than art and appeals to far more people in any multitude than any other form of expression. All forms of expression other than those of fear and pain are made by it as a medium.

With the great cry made everywhere for more expression in education, we are forgetting one of the most valuable as well as one of the most pleasure giving. Its tonic influence upon a school is apparent to all connected with high school work and there is no other subject so helpful in its unifying and uplifting power.

Since the beginning of organized effort upon the earth, human action has been directed and controlled by music. No other form of expression has had such controlling moral influence upon the conduct of the children of men.

The record of the Titanic's fate brings before us chivalric men as gallant as were the Knights of King Arthur's Court; men who were as obedient as those of the fairest names in history, largely because of music and its training. Men who faced death unflinchingly, though they saw its gaunt form grimly approaching them, largely because of the controlling power of music.

Recently, an investigation of Siberian prisons and mines has disclosed that although everything in the way of music has been denied the overburdened heart of the Russian exile, relief has been found for those sad souls by their indulgence in a chorus chanted with closed lips and an orchestra formed with manacles and women's combs as instruments of music. This wail of the combs accompanied by the sinister clanking of chains, has developed a new form of music, unlike any other known form. This last discovery adds only another element of proof to the argument that all people use music as the most simple, yet most powerful method of expressing those sentiments with which they are obsessed. No other method of communication is so easily understood by all classes. The song of the slave has been an important factor in our national life and has been one of the best guarantees of freedom for all.

During the halcyon days of Grecian triumph, her young people were taught music as one of the branches of mathematics; because they said it taught them not to be self-willed and fanciful, but to see the beauty of order, the usefulness of rule, the divineness of laws. Would that we might have the same idea of education today.

Were the systematic study of music made a major subject in our high school course today, given equal credit with mathematics or Latin, hour for hour, and credited by our colleges in the same way, the influence upon the next generation along the lines of social unity, uplifting of ideals and moral control, would be beyond measure.

We spend much time wrangling about our present day society, in school and out, about the menace of the low ideals of our young people, about their gross materialism, but music properly taught and the singing of the proper kind of songs in school, and out will do much to conquer these evils and to banish social discontent with which our people are threatened.

There are no pedagogical or legal reasons why the laws of harmony should not be taught to the same extent as are the laws of the no less definite subject of mathematics; there is no apparent reason why the history of music is not deserving of as much attention as is the history of a country or the history of commerce. It is probably true that as many take naturally to music as there are of those who take naturally to secondary mathematics, and the history of any country is built around about the music of that country.

A course as outlined by your committee would permit of as much growth in real development and power as would a course in either of the subjects named, and think how materially it would add to the entertainment in the homes of today as well as to those of a generation hence! Psychologically music has a strong claim to a prominent place in our school course, and it would appear that for obvious reasons, it should be studied definitely during the high-school years.

Not much can be done with harmony, or history of music, in the grade schools and therefore the high school is the only opportunity open to many of our young people for the securing of a general education including these things.

In the natural order of things, it would seem that education and educators are finally asserting their independence and that our young men and women are to receive that which will bring to them the largest degree of success and happiness, rather than that they be trained merely in the method whereby they may most quickly enter one of the departments of business or trade. Four years of the pupil's life has hitherto been spent in the study of the culture of nations long since dead and in the development of handwork in order that he produce something for the markets of the world; would it not be well for us to spend a part of this time in helping him to discover what powers and impulses lie within himself and to teach him to be a producer of pleasure and recreation for himself and others?

After the reading of the paper, Mrs. Smith said that Mr. Lawyer was a member of the committee on standardization and that the committee was indebted to him for much practical advice.

Two announcements were made, and then the formal discussion of the report of the committee as read at the morning session was opened. The different articles were acted upon separately. On motion, Article I carried without any modification.

Instead of the phrase "Glee Club Work," "Work requiring no preparation" was substituted in Article II. With this amendment a motion to adopt carried.

Article III was adopted as read with the exception of some slight modifications in wording.

The session then adjourned.

Sallie J. McCall, Secretary.

#### PHYSICAL SCIENCES SECTION.

##### *Morning Session.*

The meeting was called to order by the chairman, C. H. Elliott, of Carbondale, Ill. The chairman announced the absence of the permanent secretary, Dr. F. R. Watson of the University. The chair appointed Mr. Virgil Lohr, teacher of chemistry in the Township High School at Joliet as secretary pro tempore. Prof. F. B. Barber of the normal school, at Normal, Ill., was then introduced. He spoke at length on the teaching of chemistry from the view point of daily life. He illustrated his lecture with charts and data compiled from various sources, the chief of which are the reports of the U. S. Commissioner of Education.

The discussion of this paper was opened by Mr. John Stoneking of Robinson. Mr. Stoneking emphasized Mr. Barber's point of view. Further discussion was offered by Mr. Willis Tower, Mr. McFarland, and Mr. Conrad of Decatur.

Mr. C. M. Wirick of the Crane Technical High School in Chicago asked for an expression from the Section on the question of courses in first year science. Mr. Barber suggested that a committee be appointed to act in conjunction with committees from sections devoted to agriculture and domestic science. An animated discussion of first year science in the high school course resulted. Mr. Wirick moved that the chair appoint such committees as it sees fit and that this committee or these committees work in conjunction with the sections named looking toward the drafting of a course in first year science.

This motion was carried without a dissenting vote. The chair announced that such a committee would be appointed at an early date. The Section then proceeded to discuss the syllabus of Chemistry which was adopted by the Conference last year. The committee which drafted this syllabus asked that the section give the committee the benefit of its judgment upon the place of certain topics and also the benefit of additional suggestions. The discussion developed the fact that a large number of the teachers were in favor of adding topics, where possible, that would assist in the teaching of chemistry in relation to daily life. Mr. Schmidt of Belleville moved that the committee be instructed to add topics to the syllabus which would include those topics in organic chemistry that would be of use in the teaching of household science and the subject of sanitation, whether offered in connection with that course or with physiology. This motion was unanimously carried and the chair instructed the Section to prepare and add to the syllabus before the same was sent to press in the high school manual such additional outlines. Mr. Andrews asked for an expression of the opinion of the Section on the relative position of physics and chemistry in the high school course. Mr. Bean asked that a vote be taken on the question and it was found that a slight majority of those present favored and offered chemistry before physics.

The chair invited each one present to send to C. H. Elliott, Carbon-dale, Ill., criticisms and suggestions on the syllabus. In conformity with the action of the Section, the committee was instructed by the chair to receive such suggestions, to revise the syllabus in the light of these and the action of the section, and to send the revised report to the High School Visitor for printing in the new edition of the high-school manual. The Section adjourned at 11:20 A. M., to visit the various departments of the Chemical Building.

Virgil Lohr, Secretary Pro Tempore.

### *Afternoon Session:*

The meeting was called to order by Chairman Elliott. Professor C. R. Mann, of Chicago, read a paper on the topic: "The Teaching of Physics in Connection with its Uses in Everyday Life." A discussion followed, the participants being Professor Barber, Professor Watson and Mr. C. H. Smith.

The Section then listened to the report of the committee appointed to revise the syllabus on the Teaching of Physics. A discussion followed and the committee was directed to modify its report in accordance with the discussion brought forth.

The section then visited the laboratory under the guidance of the physics faculty.

F. R. Watson, Secretary.

Following are given the papers presented by Professors Barber and Mann, also the report of the Committee on Physics Syllabus, with modifications as directed by vote of the Section:

#### Teaching of Chemistry in Relation to Daily Life.

Professor F. D. Barber, Normal.

When your chairman requested that I address you at this meeting upon the subject just announced, I warned him that the task he was setting for me was not an easy one. I also warned him that he was doomed to disappointment if he expected me to attempt to tell you teachers of chemistry just what you should teach, and just how you should teach it. While I have taught many classes in chemistry in the past, I am no longer teaching that subject. I deem it, therefore, manifestly improper that I now assume the role of a teacher of chemistry teachers. There are, however, some foundation principles which to my mind, should govern the teaching of all science in the high school. I shall attempt to discuss these, especially as they bear upon the teaching of physics and chemistry.

At the very start, I must beg your indulgence and patience while I call your attention to some statistics which I feel certain we should all get clearly in mind. I know that figures are generally regarded as dry and uninteresting, but if we teachers of physics and chemistry are to discover the real cause of our own present dissatisfaction with our work and its accomplishments, I believe that we will do well to consider *facts* as well as *theories*.

My *first thesis* is: We are not now reaching the number of young people we should with our instruction in physics, and especially in chemistry in our public high schools. Both of these subjects are fundamental requirements for any person who is to enter actively and intelligently into the occupation of *caring* for a home as well as many occupations which enable one to *provide* a home. In spite of the fact, which we all recognize, that with the rise of scientific farming, scientific gardening, scientific house-keeping, scientific methods entering every occupation—in spite of the fact that the foundation sciences are more needed than ever before in the ordinary occupations of life, an ever lessening percentage of public school students are studying these subjects.

The last report of the United States Commissioner of Education, 1911, states, that the estimated number of children of school age, i.e., between 5 and 18 years of age, for the school year of 1909-10, was 25,016,501, and that the number enrolled in public elementary and secondary schools was 17,813,852 or 71.3 per cent.

In a recent report by the commissioner, regret was expressed that there are no available data to show just when these absent pupils quit school. Many interesting studies have been made by competent authorities but with little or no agreement, as to results beyond the fact that they all agree that the children of the poorer and laboring class are not availing themselves of the advantages of our public schools. Perhaps the following statement by Prof. Thorndike of Columbia University, is as reliable as any ever given to show this elimination below the high school. In Bulletin No. 4, 1907, entitled "The Elimination of Pupils from School," he says: "I estimate that the general tendency of American cities of 25,000 population and over, in or was about 1900, to keep in school out of 100 entering pupils, 90 till grade 4, 81 till grade 5, 68 till grade 6, 54 till grade 7, 40 till the last grammar grade, 27 till the first high school grade, 17 till the second, 12 till the third, and 8 till the fourth." In another study, however, of 16 of the leading cities of United States, Prof. Thorndike found but 33 per cent of the pupils entering the elementary school remaining for the eighth grade. These facts are mentioned, not because they are of great importance when considering the teaching of chemistry in the high school, but merely to point out the fact that our free public school system is not being taken advantage of by a considerable proportion of those who really need and should have some such even start in the race of life. One can hardly have called to his mind this elimination of 60 per cent of the pupils of our public schools before completing the eighth grade, without asking whether it is a matter of necessity, whether all these children need quit school thus early to begin work—or, on the other hand, whether our public schools are so conducted as to appeal to pupil and parent as being really worth while. But the problem of the grades is not our problem today, only incidentally. Let us turn to the high school problem.

According to the commissioner's report for 1910, there were enrolled in the elementary schools of United States, both public and private, 18,339,828 pupils. In secondary schools, public and private, there were enrolled 1,131,466 pupils, or about 1 pupil in the high school to every 16 in the elementary school. The report further shows that the elimination from school continues unabated throughout the secondary school. The report shows that 42.09% of those enrolled in the high school were doing first year work; 27.10% were doing second year work; 18.18% third year work; and 12.63% fourth year work; 12.17 % graduating.

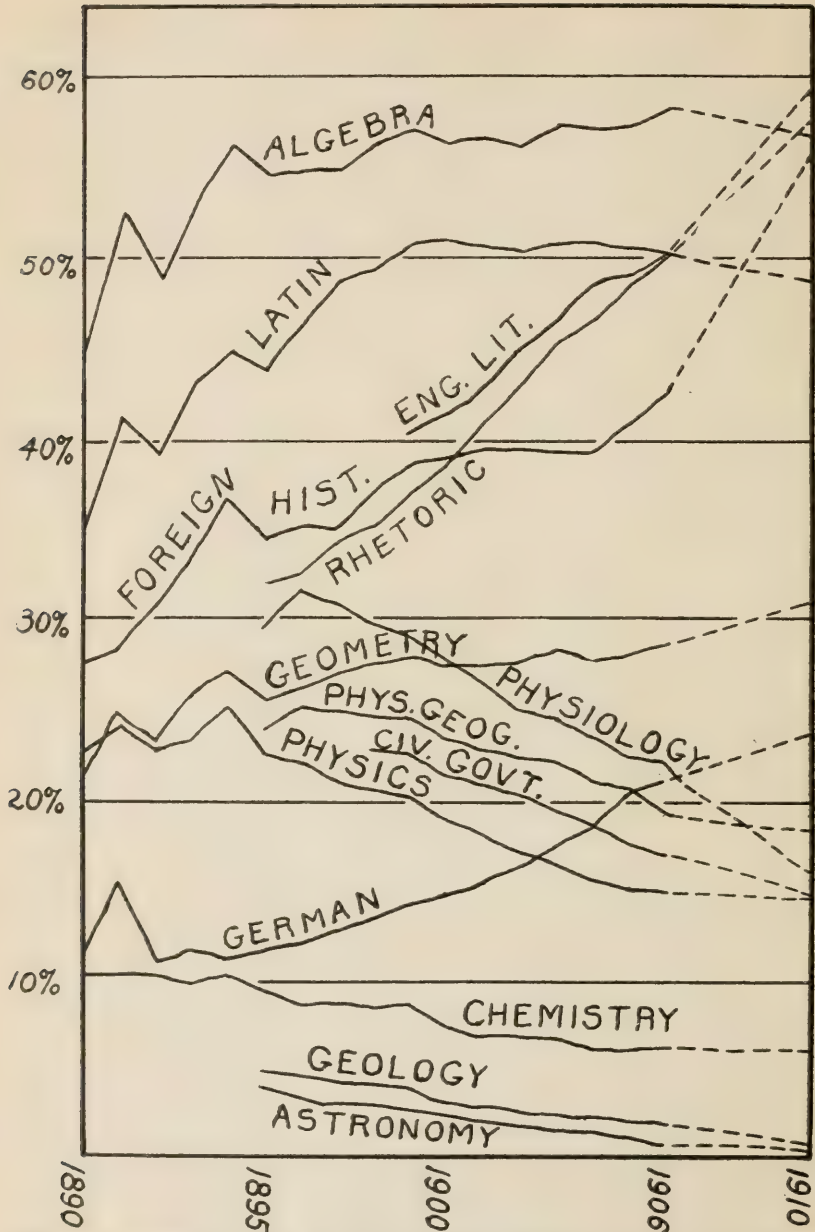
The report of State Superintendent Blair for the same year shows that elimination is going on in a similar manner here in our own state. His report shows that there were enrolled in graded and ungraded schools 1,002,687 pupils; while in the high school, there were enrolled 63,392 pupils or a trifle less than 1 to 16. In the high schools of Illinois 41.9% were doing first year work; 26.7% second year work; 18% third year work; and 14.2% fourth year work, with 12.8% graduating. Why should this process of elimination thus persist throughout the high school preventing two out of every three who enter from completing the course? Is it necessary, or does the high school course and mode of instruction fail to commend itself to pupils and to parent as being worth while? To my mind these are serious questions and questions well worth consideration by every high school teacher.

But there is another phase of the public high school problem which is as interesting to all high school teachers as is that of elimination. It is the change in the purpose with which the student enters upon his high school course and the effect if any of this changed purpose as manifested in his choice of subjects. The following table from the report of the Commissioner of Education for 1910, is of great interest in showing the development of the high school during the past 20 years.

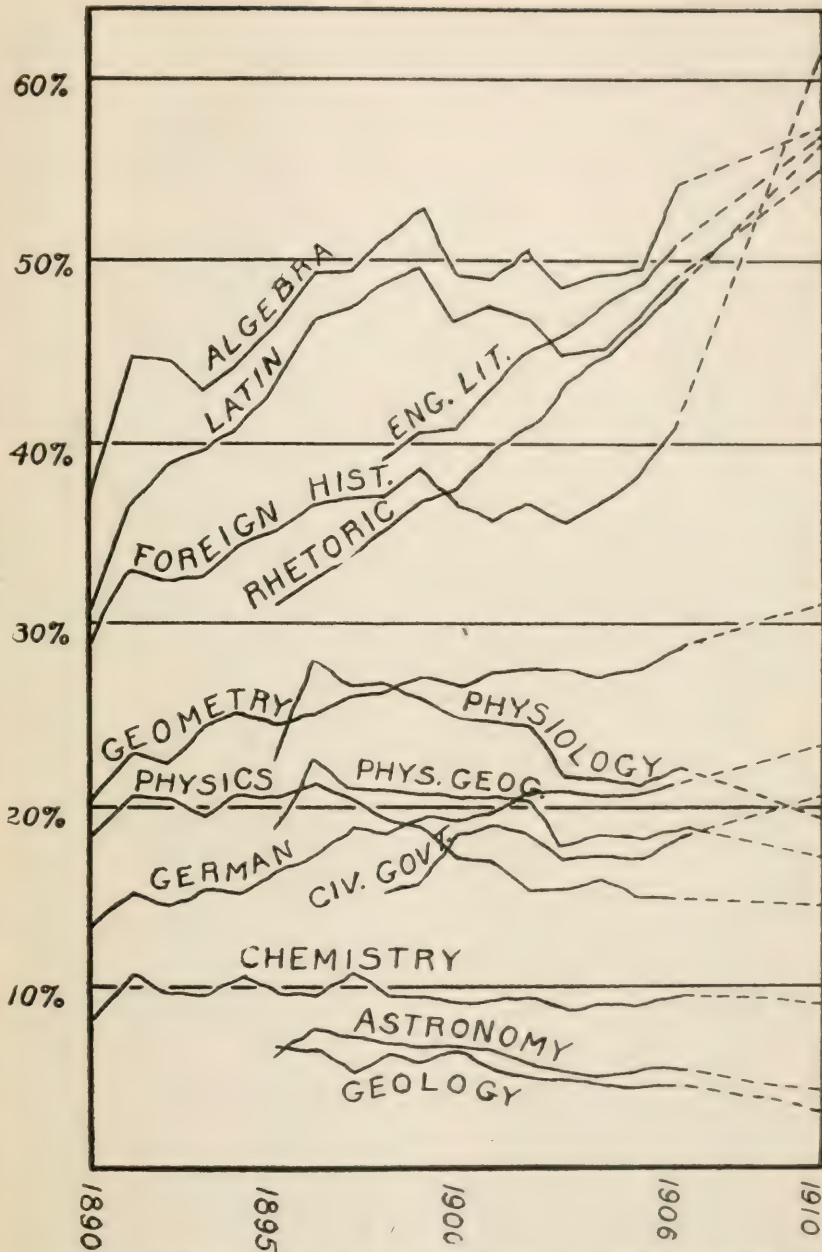
If these graphs may be relied upon to show the tendencies of our public high schools during the past twenty years, then I think we may draw the following conclusions bearing upon the discussion before us:

1. During the past 20 years, there has been a steady decrease in the percentage of high school students taking the work primarily as a preparation for college. This tendency is more marked in the case of the scientific than in the case of the classical course. In 1910, but 5.57% of the high school students were taking the course as college preparatory, in 1890, 14.44% were doing so.

2. While Latin, French, German, algebra, geometry, rhetoric, English literature, and history have all increased in popularity, some more than doubling



GRAPH—Showing per cent of pupils studying different subjects. Public High Schools, 1890-1910. From Report Commissioner of Education, 1910, p. 1139.



GRAPH—Showing per cent of pupils studying different subjects. Private High Schools and Academies. From Report Commissioner of Education, 1910, p. 1140.

the per cent of students pursuing them, all of the older sciences, sometimes called the pure sciences, have lost in popularity and in the per cent of students pursuing them. Astronomy is now studied by but about one-tenth of the per cent of students compared with 15 years ago. In 20 years the per cent of students studying physics has lessened one-third; chemistry and physical geography, have suffered a like decrease in popularity. Physiology has lost nearly one-half its percentage and geology three-fourths of its in the past 15 years. To be sure, certain applied sciences have lately been added to the high school curriculum, namely, agriculture and domestic economy, but the gain in per cent of students pursuing these applied sciences amounts to but about one-fifth of the loss suffered by the older sciences.

We are driven to ask: Why this apparent decadence in the study of science in our high schools? Are we not really living in a scientific age? Are not the foundation sciences more potent factors in the life of each of us than they were in the lives of our fathers and grandfathers? Do we not boast of the marvelous achievements of science, and of the mastery of the physical and living world which science has made possible? Was not the most characteristic feature of the 19th century the achievements of science? And does not the 20th century bid fare to advance civilization in a large measure, according to the advance science makes in giving man dominion over the forces and insight into the laws and principles of nature? If these suppositions are true, why do not our young people see the value of studying science; or, if the young people do not see the value, why do not their parents see it? Ask yourselves, teachers of modern science, whether it is possible that your choice of material or your mode of presentation can possibly be at fault. Is it possible that the old natural philosophy of 20 or 40 years ago, or even Steel's *Fourteen Weeks in Natural Philosophy*, was more attractive to the boy or girl of 16 or 18 than the modern physics? In short, are we sure that our present day public high school science is meeting the needs of the pupils and the needs of the times?

My *second thesis* is: All available evidence points to the fact that the children of the wealthy and well-to-do still do study science, but that it is the children of the poorer and working class who do not study science. As a preparation for college, science still holds its own among high school subjects, but as a preparation for life's work, it has fallen far behind. If this is true, it seems to me that this is a great defect and inconsistency in our present school system.

Again I must beg your indulgence while I call your attention to a few facts. Referring again to the report of the Commissioner of Education, we find that in 1910, while the percentage of students in the first, second, third, and fourth year of the public high school was respectively: 42.89%, 27.10%, 17.83% and 12.18%, in the private high schools and academies, the percentage for the four years are 35.21%, 27.16%, 21.15% and 16.48%. This shows that the process of elimination is far less active in the private than in the public secondary schools. Now, physics and chemistry are almost universally third and fourth year subjects, therefore we shall expect to find a larger percentage of secondary school students studying these subjects in the private than in the public schools of high school grade.

Turning to the analysis of the percentage of students in the various courses and studies in the private secondary schools, we find that, as was the case with the public high schools, during the past 20 years, the following subjects have apparently gained in popularity: Latin, French, German, algebra, geometry, rhetoric, English literature and history. In striking contrast with the public high school, however, we find that the natural sciences have lost but little in popularity, in fact chemistry has even made a slight gain.

Now these are important facts for we must remember that the students in private secondary schools are the children of parents who can afford not only to pay tuition but in most cases, to pay board as well. Again it should be noted that three times as large a per cent of the pupils in these private schools were preparing for college as was the case with those in the public high schools.

This all means, if it means anything, that science in the secondary schools is still reasonably popular with the children of the wealthier classes, and even so, whether they are preparing for college or not. I suspect that no one of us is ready to account for this apparent greater popularity of science in the private schools on the grounds that they have better equipped laboratories or better teachers than are

provided in our better high schools. Those among us who are more or less acquainted, both with our better public high schools and with the private high schools, and preparatory schools of the East as well as the West, know well that as a rule, the laboratory facilities and teaching force of our public high schools compare favorably with those of the private schools.

Does all this mean that the sciences are regarded as chiefly cultural studies? Does it mean that the students of our public high schools, many of whom come from the laboring classes, regard the foreign languages, mathematics, English literature, or history as of greater value than the sciences? Or may it mean that the course in physics and chemistry and the biological sciences have been made unpopular by the choice of material and method of instruction?

I am inclined to believe that each of these suppositions has something of a foundation in fact. I am inclined to believe that the high school science of today, must be regarded as chiefly cultural. Possibly there are good grounds for the children of the laboring class considering many of the humanistic high school subjects as of greater practical value than is science as it is commonly taught in our high schools. I am decidedly of the opinion that the teaching of physics in most of our public high schools during the past 15 years, has been of such a character as to drive many comparatively bright and promising students from the class. I think the same may be said in a less marked degree of the teaching of chemistry. If we really wished to drive the more timid girls and the more backward boys from the physics class, I can conceive of no better way than to make the work in the laboratory consist solely of rigidly quantitative work, and emphasize in recitation the solution of problems foreign to the student's life experiences. Can anyone conceive of a high school girl becoming enthusiastic over the solution of problems like the following, taken from one of the most popular as well as one of the best texts of recent years: "What total pushing force do the propellers of the *Kaiser Wilhelm der Grosse* exert when she is using her maximum horse power (40,000) and is running at 24 knots (40 km. per hour?)" What proportion of high school students can reasonably be expected to be interested in and derive much benefit from such topics as the absolute units of force and work, uniform accelerated motion, or the laboratory exercises on specific heat, or the study of concave and convex mirrors? Such exercises must be regarded, it seems to me, as purely academic and cultural. Is not altogether too much of our science teaching of this character?

When I suggest that physics and chemistry, at least, are so taught in our high schools as to tend to kill off any interest that the student may have in the subject, and to influence those who have not yet entered the classes to shun them if possible, I am speaking from some personal knowledge obtained from teaching those subjects to students of high school attainment. I am aware that Prof. Fisher of Cornell has attempted to show that possibly the figures which I have quoted from the commissioner's report, may not necessarily mean that the sciences are really as unpopular as figures indicate. His argument, however, is based apparently entirely upon statistics. After carefully studying his four page argument in support of his contention, I am forced to the conclusion that he leaves the matter about where he found it. As the net result of a complicated and highly technical argument based upon meager and unsatisfactory data, as Prof. Fisher himself admits, he concludes that a portion of the apparent unpopularity of the sciences is due to the fact that science is not being given a fair opportunity in the high school curriculum. He attempts to show, although with considerable timidity regarding the certainty of his deductions, that if all high school subjects had been given, the same opportunity during the decade from 1894 to 1904, that Latin, instead of gaining some 14% in popularity, would really have lost about 8%; algebra, instead of gaining 7% would have lost 6%; geometry, in the place of gaining 8% would have lost about 14%; physics in the place of losing 34% would have lost 36%; chemistry, instead of losing 31% would have lost but 23%; physical geography instead of losing 5% would have gained 5%.

Prof. Fisher does not suggest that there may possibly be anything wrong in the choice of subject matter presented in the sciences nor that the manner of presentation might be improved. His solution of the dilemma in which high school science finds

itself today, is apparently to offer courses in each line of science in practically each year of the high school course. His closing paragraph is well worth careful study whether we fully accept his conclusion or not. He says: "I am inclined to conclude from this table, that, in spite of the general impression to the contrary, American boys and girls like the sciences; both exact and natural, better than they like the languages, *provided they only have as good a chance to get at them*, and the way to save the situation for science is to give them the chance early in the course. I assert with confidence, that had 80% of Dexter's schools in 1904, offered four years of chemistry and physics, instead of four years of Latin, as they did, we should have found the figures of percentages just about reversed, or even worse for Latin."

According to a recent report of the Commissioner of Education, our public high schools are thoroughly democratic in character and ought to provide for the training of those who have to earn their living by the sweat of their brows as well as for those who are to enjoy the privilege of further training in the college, university, professional or technical school. It is interesting to note that the students in our public high schools are drawn from every class of people and are *certain to enter every field of employment*. According to this report, the pupils in our public high schools come from the following classes:

1. 10% whose fathers are professional men.
2. 21% whose fathers are operating farms worth over \$5,000.
3. 15% whose fathers are operating farms worth less than \$5,000.
4. 10% whose fathers are in business or on salaries with incomes of \$2,000 or more.
5. 14% whose fathers are in business or on salaries with income of \$1,000 to \$2,000.
6. 14% whose fathers are skilled artisans making \$750 or more.
7. 16% whose fathers are unskilled laborers.

Commenting upon the character of the modern public high school, the report says: "The opportunity to advance in that type of work which leads to the college, university, professional or technical school is enjoyed by all. It is in *this particular* that we have made good our boasted claim of equality of opportunity. While the high school is thoroughly cosmopolitan in its membership, it is noticeable that a much larger proportion of children from well-to-do families than those from of more moderate circumstances or from the families of the poor are found in our high schools. It is also to be remembered that those who do not wish to take the course which leads to college or professional school have as yet, very little provision made for their education. We may be proud of the great number of boys and girls enrolled in our high schools, but we are justly ashamed of the meager opportunities afforded those who are to enter the industries."

As a *third thesis*: I maintain that the courses given in our public high schools should be so organized as to be of the greatest value and interest to those pupils whose education ceases with the completion of the high school course. The day has passed, I believe, when we should organize our high school course for the purpose of preparing the pupils for college. I have already shown by the report of the Commissioner of Education, that only 5.5% of our high school graduates are preparing for college. How then, are we justified in organizing our high school courses chiefly as preparatory courses? But it is sometimes stated that the course which is best for the college preparatory student, is also best suited to meet the needs of the high school student who has no intention of going to college. I, for one, do not accept this statement. It is most natural that the college professor shall regard the year's work done in the high school in physics or chemistry, as the first years' work in a three or four year course in that subject. I believe that I am in a position to see this question, in a measure, from both sides. About one-half of the students in the Normal University physics classes have had one year's work in an accredited high school, i.e., a high school accredited at the University of Illinois. The other half of our students in physics have had less work in that subject—some have had no physics. Probably about one-third of our chemistry students have had one-year's work in high school chemistry. Possibly I realize as well as does any college instructor in either of these subjects the advantages to be derived from having all students who are given credit for high school work present an even front and a good foundation for

further work. Nevertheless, I am convinced that it is a great mistake for our high schools to make their courses primarily preparatory courses. The ideal preparatory course in either physics or chemistry is simply the first year's work of a three or four year course in that subject. The ideal high school course in either of these subjects, is an abridged or abbreviated one year course in the subject and must be so planned and developed as to present as complete a view of the entire subject as is possible in that short time. In the preparatory course, there will be ample time to lay a strong and substantial foundation upon which the future work will rest; in the ideal high school course, there will be time to consider, but a limited number of important foundation principles for much time must be spent in giving content and meaning to those principles which *are* studied. The *preparatory* course in chemistry may possibly omit the applications of the chemical principles to the affairs of life for the student will be expected to take a more extensive course in general chemistry in college and possibly courses in qualitative and quantitative analysis, in organic and industrial chemistry, in all of which the *application* of the principles becomes more and more evident. For the 90% and more of the high school students who do not expect to take further courses in chemistry, it is essential that they receive as much assistance as possible in seeing how the principles studied bear upon the affairs of life. The high school boy needs to have his chemistry related intimately to his daily task of caring for the furnace, to the combustion of oil or gas in the lamp by which he studies to cleaning and sanitation, to his efforts at gardening and agriculture and to the industries in which his father labors. The high school girl needs to have her chemistry related intimately to cooking and cleaning, to dyeing and dietary, to the handling of gasoline and the gas stove, to sanitation rather than meditation. To teach merely the principles of elementary chemistry in the public high school and then expect the pupils to go out into life and intelligently apply those principles is expecting the impossible. To put ten (10) pupils of a high school, nine of whom never expect to go to college, into a chemistry class and then give them the first quarter of a four year course in chemistry because the *one* does expect to go to college is, to my mind, little short of a crime. If the conditions demand that all ten be given the same course, by all means fit the course to meet the needs of the nine whose school days end with the high school graduation day.

Suppose you were a working man with \$1,000 with which to build a house. Suppose you had nine neighbors, eight of whom were fellow working men, each with \$1,000, and one was more fortunate having \$4,000. You are all intent upon building houses to shelter your families and give them comfort and protection. Some power quite beyond your control decrees that all of your houses must be alike so far as the expenditure of the first \$1,000 is concerned. Suppose that this same power should consult only the one neighbor with the \$4,000 concerning the manner in which this first \$1,000 shall be expended and suppose that between them, they should decide that it was best for him that the \$1,000 should be expended in building the foundation, in cementing the basement, in grading around the basement, planting the lawn, and laying cement walks—would you willingly consent to spend your entire savings in duplicating his plans? He has \$3,000 left with which to erect the superstructure, put on a roof, plaster, paper and finish; you have nothing. And how would it strike you, if, when you protest and express the opinion that if all must build alike, that it would be better for each to build a modest cottage costing \$1,000, the dictator should reply, "No, that is not best for the man with his \$4,000. He is getting just what is best for him and if you fellows have any gumption in you, after you have put \$1,000 apiece into foundation, you will have the desire and ability to find some way of building a house upon it just like your neighbor's."

Is the illustration inappropriate? Is it not analogous? Haven't we been told often that if the high school pupil be taught the foundation principles of a science, that he will be able to apply those principles as he goes through life? And if he fails to apply them, isn't it attributed to his lack of gumption? Why not let the occasional student who *does* have the advantage of attending college after graduating from the high school manifest a little gumption in fitting himself into his college class? If necessary, why not let his college instructor also manifest a little gumption in

adapting the college courses to meet the need of the high school graduate? But I hasten to remind you that this statement applies to myself as well as to others for fully one-half of my students are high school graduates.

As a *fourth proposition*, I wish to set up the following: While it is preferable to have science taught in such a manner as to show how the principles taught, are applied to the affairs of life rather than to teach the principles alone, it is still better to teach the science *out* of daily life. By this I mean that the approach to the teaching of any principle should be made through the study of the affairs of daily experience. Through the study of the pupil's environment, an unsolved problem is discovered, i.e., a problem *he* has never solved. His interest is aroused, and he attacks the solution with energy and animation. Let me illustrate with a concrete example:

We may as well begin where the ordinary text begins, with combustion. By the way, it is well to note that this is also where the human race doubtless also began the study of chemistry. I certainly should not begin with the preparation and study of the properties of oxygen. Mercuric oxid and potassium chlorate are certainly not vital factors in the average high school pupil's past experiences. To begin the study of chemistry in this way, as perhaps the majority of texts do, is not following the well established pedagogical precept of going from the known to the related unknown. It is a desperate plunge into the depths of the unknown. I recall vividly my own feeling of awe as I took that plunge. I am thoroughly convinced that there were some things, some facts, related to oxidation and the broader topic, combustion, with which I was familiar and through which a more skilful teacher could have led me into the study of the chemical principles which I needed to learn. It seems to me to be the antithesis of a pedagogical proceeding to set a boy or girl of 15 years to heating an entirely unknown red powder or a mixture of white and black chemicals also unknown, in order to obtain an invisible, odorless gas equally unknown, as a *first experiment* in chemistry. After a few, or several, experiments with this unknown and invisible gas, the pupil is finally led to see that it is related to many of his daily experiences. It seems clear to me that this first attack upon chemistry, when taught in this manner, is anything but going from the known to the related unknown. It is a plunge into the unknown with a subsequent return to the known. All too often we find as we proceed through the text, that the return to the known, i.e., the application to the affairs of life, is set in small type with the invitation to omit if time is short or if the teacher's knowledge of applied chemistry is somewhat limited.

In the place of beginning, the study of oxidation and combustion in the manner indicated above, why not begin by the study of the use of the burner and chimney of the kerosene lamp, the use and control of the air supply in burning gas or gasoline, the historic experiment of burning the candle under an inverted bottle, the use and proper control of stove and furnace dampers, the construction and use of the Bunsen burner. If most of the facts previously known to the pupil concerning combustion, were thus called to his mind, and if many new facts and conditions were noted during the performance of a half dozen well chosen experiments dealing with the practical combustion of kerosene, gasoline, gas, wood, coal or other common fuels with which the pupil *has had* personal and intimate acquaintance—if this was done, it seems certain to me that the pupil would then have some real incentive for the study of that portion of air which he had found necessary for the supporting of combustion. In short, I believe that combustion and oxidation can be taught with far greater value and effectiveness if developed as an explanation of questions arising in the mind of the pupil as he recalls past experiences which he is now unable clearly to understand, or as he now experiments with those combustible materials with which he has long been familiar. Of course he *must generate oxygen* and to some extent, he must investigate its properties. What I insist upon is this: The pupil should not feel that the study of oxygen and its properties is of great importance, *per se*, but that the true explanation of many past life experiences *is* of great importance. From several years' experience teaching science to students of high school attainment, I am convinced that it is common practice for high school teachers to spend most of their time and energy teaching the principles of science without relating them closely to the affairs of life. I believe that this means the spending of all our resources in

the construction of the foundation; I believe that if our pupils could be given a vision of the super-structure, of the completed entire structure, with all its useful appliances and pleasing decorations, that we should then get a heartier response from them as they work upon the foundation. If we are to proceed from the known to the related unknown, then by all means, we must start with the pupil's past experiences. This means that we must start with the affairs of life and discover just what the pupil does and what he does not know about his surroundings. The real explanation of many daily processes and of many appliances in daily use will be found lacking. The recognition of the fact that he does not comprehend the real meaning and significance of the most common affairs of life stimulates the pupil to effort and creates an interest which can be aroused in no other way. It is a wholesome, abiding interest and not the interest of wonderment or even awe such as results from plunging the pupil into experimental work which involves material entirely unknown to him and develops principles the true significance of which he does not see and comprehend at the time. Only those who have consciously and frequently attacked new units of instruction in science in the manner just described can appreciate the results which may be obtained by this method.

As a *fifth proposition*: I maintain that there is no divorcement between pure and applied science in life, and there should be no such divorcement in school. The teacher of physics or chemistry should be concerned with very much the same physical and chemical phenomena that concerns the teacher of agriculture or of household science. The teacher of science should place the emphasis upon the principles of science, developing those principles out of the applications found in life; the teacher of the so-called applied science should place the emphasis upon the application, but never neglecting the scientific principles involved. I take it that each of us would condemn the teacher of agriculture who studiously avoids reference to the principles of science involved in any particular unit of instruction until he has completed his presentation of that unit and then briefly states the principles involved. If I am not mistaken, this is exactly the procedure, however, in our science teaching. We dive into the presentation of the principle with little or no reference to the application. If the matter is presented in text-book form, we sometimes find some opportunity to present the practical applications in a paragraph of fine print which in itself, is a suggestion that this material is unimportant and should be omitted if anything is to be omitted.

This leads me to my *sixth proposition*, namely: With the introduction of agriculture and household science into the high school course, there has arisen much necessity for the formulation of a course in general science suitable for the *first year* of the high school. The teacher of household science discovers that the girls in her classes have never given a thought to the explanation of processes which are carried out daily in the home. The handling of the cook stove, the use of cleansing materials, matters of sanitation and lighting, solubility of different solids in different liquids, and many other principles and processes involving physical and chemical principles have never been given a thought by the average student entering the high school. And yet according to the prevailing arrangement of the high school course, physics and chemistry are taught only in the third and fourth years. This means that neither agriculture nor household science can get much benefit from the instruction given in these subjects. An elementary course in general science covering the first year of the high school, at least two-thirds of the time being devoted to physics and chemistry would be of inestimable value in giving content to the courses in agriculture and household science. In my judgment, our public high schools should offer just this sort of a course and make it a required course for all agriculture and household science students. Such a course in general science, may be made intensely interesting and of the greatest value. For the past three years all students in the University High School in connection with the Illinois State Normal University, have been required to take one term of work in the elements of physical science the first year with very satisfactory results, although I am of the opinion that the work should extend over two terms and include more chemistry bearing upon agriculture and household science. This course is no longer an experiment for the beneficial results obtained fully justify the existence of the course.

## Summary.

By the way of summarizing this paper I wish to call your attention once more to the following propositions which I have attempted to prove:

First: The public high school is failing woefully to reach an adequate number of young people with instruction in the sciences, including physics and chemistry. The elimination of students through the elementary school and through the high school is the first cause of this failure.

Second: But the most noticeable cause of this failure to reach young people with science instruction, is the steady decline in the per cent of students who are pursuing these subjects in the public high school. At the present rate of decline in the per cent of students studying the so-called pure sciences, there will practically be no science classes in our public high schools twenty years hence.

Third: Two tendencies are noticeable in studying the statistics of our public and private secondary schools, namely: 1st. The per cent of students in our public high schools who are preparing for college has fallen from  $14\frac{1}{2}\%$  in 1890 to  $5\frac{1}{2}\%$  in 1910. In the private secondary schools no similar decline is found in the per cent of students preparing for college. 2d. This fact is significant when we note that while the study of science in the public high school has fallen, more than one-third in the 20 years, there has been no noticeable decline in the study of science in the private schools. This indicates clearly that the boys and the girls of the rich and well-to-do still study science while the children of the poorer classes are increasingly devoting their energies to the study of Latin, German, French, algebra, geometry, rhetoric and literature. This may be best, but it challenges our attention.

Fourth: Since an ever decreasing per cent of our public high school students are preparing for college, and at the present time, but 1 in 20 are taking the high school course for that purpose, it follows that our high school curriculum and most of its courses should be framed to meet the greatest need of the 19 out of every 20 who are not preparing for college.

Fifth: It is logically impossible for the courses in such subjects as physics and chemistry in the high school to be laid out so as best to meet the demands of both college entrance requirements and also to prepare for life's work. In one case we need to teach the first year's work in a three or four year course; in the other case, we need an abridged one-year course in the subject. The time will come before many years when the people will demand the latter course rather than the former in our high schools which are too small to support both.

Sixth: From a pedagogical point of view, the common method of attack upon the principles of science taught is unsound. It does not generally proceed from the known to the related unknown. Experience has shown that the pedagogical method is conducive of the greatest interest.

Seventh: In life, there is no divorcement between pure science and applied science. Such a divorcement is altogether too evident in modern science teaching.

Eighth: The introduction of applied science into the curriculum of our public high schools, namely, agriculture and household science, makes it very desirable that a year of general science consisting largely of physical science be introduced in the first year. Such a course has proved satisfactory and of the highest value.

While this paper does not pretend to be strictly a development of the topic assigned, it is to be hoped that it has some bearing upon the question of the teaching of chemistry in the high school.

Bringing Physics Close to the Daily Life.

Professor C. R. Mann, Chicago.

The school system of Germany has often been held up to the teachers of this country as a model of perfection. Germany has been called a nation of school-masters, and the wonderful progress of its industries has been attributed in no small measure to the rigid training and high efficiency of its gymnasia, its universities, and its vocational schools. Even at the present moment our country is being urged on many sides to establish alongside the regular public secondary schools an independent system of vocational schools, the chief argument in favor of this plan being the fact that it was "made in Germany."

Notwithstanding the fact that the reputation of the German schools is so brilliant on this side of the Atlantic, there are many thoughtful and earnest dwellers in the Fatherland who consider the training given by their schools to be of very doubtful educational value. Thus, some twenty years ago, Emperor William II. called a congress of the leading school-men of Germany to consider what could be done to bridge the chasm that yawned so wide and deep between the work of the schools and the daily lives of the pupils. Little was accomplished as the result of this congress. The school-men declared it were little short of sacrilege to experiment with schools, which had always enjoyed a reputation for perfection equalled only by that of the medieval monks. Since that time, the vocational and industrial schools of Germany have developed alongside, and, in large measure, independent of the "regular" schools. This unfortunate double system of public schools was made necessary because of two relentless and irreconcilable facts, namely: 1, the needs of the people; and 2, the conservatism of the school-men.

In spite of the fact that the vocational schools of Germany did bring education and life nearer together for the working classes, the children of the intellectual classes continued their double existence in the world and in the school respectively until very recently. Day has, however, now begun to dawn on the academic landscape; and efforts, which originated among the teachers of science, are now being made to establish some semblance of a relationship between the school routine and the daily lives of the pupils. The evils that are being eliminated are over-systematization, rigid uniformity, and the belief that words, signs and symbols can be made to serve in the educational process in place of concrete materials and real problems.

Many will doubtless recognize the similarity between the experiences of Germany and those through which this country is now passing in the matter of bringing school and life to have some thing in common besides the children themselves. The needs of the masses for vocational schools are only equalled by the needs of the pupils in the regular schools for mental pabulum that nourishes them and helps to develop their characters. Can you doubt this in the face of trustworthy reports, like that of the City Club of Chicago, which show that the present public school system fails to reach more than half of the school population? If so, study the statistics of elimination and retardation and be impressed by the enormous annual waste in material resources thus caused—the much more impressive and disastrous waste in human resources can never be calculated.

In this state of Illinois, as you all know, the crisis is imminent. The state legislature is considering a bill for the authorization of a second independent system of schools, intended in some measure, to atone for the short-comings of the present public schools. The chief argument in favor of the proposed plan is that the school men who are now in control are both incompetent and unwilling to reorganize their work so as to meet the needs of that half of the school population which is not benefited in any marked degree by the present system. As final proof of this argument, Germany is held before us as a model, and we are urged that, as it is in the Fatherland, so must it be here. In other words, the incompetency of the teachers in permitting the proved inefficiency of the schools to continue is condoned, and we are invited to authorize additional expenditures on the ground that others, not school-men, can succeed where we have failed.

What would a captain of industry think of an analogous proposition with regard to his manufacturing plant? Suppose that a plant and its employees wasted half of the raw material supplied to it; would the manager enlarge the plant and take on more hands of a different sort in an endeavor to reclaim some part of the original waste? Yet the idea is abroad that this sort of a procedure, obviously absurd in an industrial enterprise, is, nevertheless, justified in school practice. The basis for this idea seems to be the fact that teachers are supposed to be so conservative that they are unwilling even to consider a new idea, much less to adopt it.

We teachers, naturally enough, repudiate this accusation. We pride ourselves on being the most progressive of all people. Do we not all use our last bit of strength to keep up to date? Yet, where there is so much smoke, there must be some fire. It behooves us then not merely flatly to deny the charge, but rather to analyse carefully our methods and results in the effort frankly to discover wherein we have given ground for popular misconceptions.

This analysis might be found to be a difficult, not to say embarrassing, undertaking if it were not that the problem may be stated in a somewhat different way which permits of a ready answer. Instead of asking what grounds we have given for a reputation of ultra-conservatism, we may ask whether we have as yet, succeeded in bringing the school work close to the lives of the pupils. After graduation, our education and our lives are most inextricably entangled. Is it so before graduation? For if it is, the problem of vocational education vanishes. If the life of the child is his education, or if his education is his real life, he is developing to serve society to the full extent of his abilities. But if this is not true, if his schooling and his life are to him two strangely incompatible forms of existence, then there is something radically wrong with the school. Are we then making education and life a unified existence for the pupils?

The answer to this question must be an unequivocal No. The simple fact that this Conference and other similar conferences all over the country are considering how to bring school work close to child life is complete proof of the correctness of this answer. We teachers stand convicted by our own acts. We recognize that we fail at this vital point.

But even though we fail, are we willing and ready to improve and constantly to work for a closer union of education and life? Here the answer is equivocal: some are, and some are not. Some are willing to try, but are placed in circumstances where they are not free to make the efforts. They are blocked by the authority that works from above downward—particularly the latter. Others express in words their willingness to make the trial, but continue in deeds to run along in the same old rut. Still others are eager to break away from the present system and to strive for a more efficient one, but they do not know where to begin. In the hope of helping such as these in gaining a vantage ground from which to work for the union of education and life, the following hints are given. They constitute a brief summary of the main points of agreement among those who have in some measure, succeeded in breaking loose from tradition and from the vested interests of school paraphernalia and equipment.

The first of the false gods that holds and will forever hold education and life asunder is the idol of uniformity. How this graven image ever came to be given an honorable place in the temple of learning passeth all human understanding. The genius of a man, the characteristics that mark him off from his fellow men and give him his priceless personality, are his individual differences. It is because he has traits and combinations of traits which are different from those of any other man that he is interesting and powerful or weak as the case may be. In life, it is his individual differences that mark him for success or failure; but in school, these must be ignored and blighted. "Everyone is best trained for his greatest usefulness in life by destroying his individual differences, by putting him through the same intellectual mill with everyone else;" so says the idol of uniformity.

The absurdity of this idea in general needs not to be expanded here. It has been recognized, and efforts have been made to suppress it as far as programs of study go. Thus there are the classical courses, the scientific courses, the technical courses, each of which is supposed to minister to a definite type of mind. But here again the idol has but been broken into smaller pieces, each fashioned after the form of the whole. This arrangement has again proved unsatisfactory, and the elective system has done much to shatter it. A perfectly rigid course is found at present only in highly specialized professional schools.

But the idol of uniformity still persists in the specifications of each single course. It is manifestly so great an administrative convenience to have a unit of physics mean the same thing—at least superficially—whether the work is done in Florida or in Oregon. So the idol has been shattered into still smaller fragments, and each of these, fashioned in the likeness of the original; sits enthroned in some class room. In this diminutive, unobtrusive, almost unnoticed form, the idol still holds sway over the greater part of the work of the schools. We have become so used to him that we do not recognize the fact that he sits between us and our goal, and effectively prevents our bringing about the long-sought union between education and life.

Is it any less absurd to suppose that every class in physics can be taught successfully in one set way, than it is to imagine that every mind can be trained successfully by the same grind or every malady cured by the same treatment? The experiences in the lives of the children of New York City and of those in Urbana are very different. Can one and the same physics be doled out to both with any hope of bringing physics close to the daily lives of both? Certainly not; any more than you can grow oranges and bananas at the North Pole. Then why do teachers usually take great pride in the nearness with which their course coincides with the standardized forms set up by social convention in defiance of the natural processes of the youthful mind? Were it not far better to take pride in the close adaptation of a course to the needs of the environment in which it is given? Hence the first essential for bringing physics close to the daily life is that the teachers free themselves from the servitude of this idol of uniformity. We must become iconoclasts long enough to smash these diminutive images into fragments.

The *credo* of the idol of uniformity is the syllabus. Strange as it may seem, there are numerous syllabi, all claiming to be authentic. When not enforced by some *pontifex maximus* of the idol of uniformity, these syllabi are fairly harmless. Their chief danger lies in the fact that they tend to focus the attention of teachers on subject matter. In this the syllabus is a just possession of the idol of uniformity, since the latter is only an image, possessing, it is true, the form of a man, but devoid of life, of soul, of spirit. Therefore following the precepts of a syllabus gives a merely superficial uniformity—it creates an external resemblance among physics courses, but does not necessarily assure them an inner similarity, a spirit of investigation, clear judgment, scientific imagination, or unity. In the matter of bringing education close to life, syllabi are as useless as the idol that inspired them.

Once we have freed our minds from the obsession of the idol of uniformity, we are ready to advance to the organization of a course of study that will have some chance of bringing physics and the daily life of the pupils who are to pursue it into close union. It is, however, useless to make outlines until we are well rid of the idol. Assuming that this has been accomplished, there is one characteristic of the course which is of the most fundamental importance for the purpose in hand, and this is what may be called the philosophy of the course. This determines the point of view or general attitude toward the subject and also settles the method of presentation. Taken as a whole, the philosophy determines the value of the course as a contribution to the mental development of the pupils. If this philosophy is of the right sort, the choice of subject matter is of secondary importance; for then physics enters into the pupil's life as an integral part and creates an attitude toward science and an ability to solve problems scientifically. This attitude and this ability once secured, the pupil will be able to read and experiment intelligently for himself and so to extend his knowledge of the subject as occasion may require. We will try to define this philosophy in such a way that teachers may be helped in discriminating between a weak course and one likely to be of great strength in uniting education with life.

The idea that there is such a thing as the philosophy of a course of study is probably new to most schoolmen, because syllabi and college entrance requirements have so accustomed us to look only at the external form or index of subject matter as defining the excellence of a course that we have failed to notice is far more important internal organization. For the sake of making clear what is meant by the philosophy of a course, and in the hope of attracting your attention to this most fundamentally weighty problem, three types of philosophy of physics courses will be briefly outlined.

The first is the old standby which was expressed in the college entrance statement that physics should teach the "laws and principles of elementary physics." With this end, in view, the topics demanded by the college syllabus were sorted out under the heads mechanics, heat, sound, light and electricity. The topics that fell under each head were then arranged in what adult teachers considered their order of simplicity. Thus in mechanics, the order was: centimeter, gram, second. These were duly defined without giving the pupil any clue as to what he was to do with them. These simple elements were then compounded in various ways—into meters, square centimeters, centimeters per second, grams per cubic centimeter, and so on. The distinction between mass and weight was always carefully made, and each item was carefully memorized so as to be available at the next examination.

In electricity, in like manner, we must begin with the electric charge obtained by rubbing a glass rod with the skin of an unfortunate cat—obscure and pitiful victim of science! Then followed the action of two charges on each other, with descriptions of the various stunts which the two charges could be made to perform—how they could be imprisoned and released, multiplied, divided, or annihilated as the case might be. In all of this, the topics were merely described and experiments presented which might serve to illustrate them and make them concrete.

This organization of the course is generally called the "logical" order because it proceeds from what is to the adult physicist simple to what is to him complex. The philosophy back of it may be called the "encyclopedic" philosophy, since it aimed to convert the pupils into walking encyclopedias—temporarily at least. In this type of course, there is usually little unity, no repetition, and no problems that are real to the pupils. The victims usually gained from it, a hodge-podge of jumbled memories, a few catch phrases which they could not use rationally, and no ability in solving scientifically the real problems of their daily lives.

This encyclopedic philosophy was dominant in physics courses from about 1890 to 1905. During this period, physics justly became one of the most unpopular subjects in the high school curriculum. Since 1905, its influence has rapidly declined for two reasons, namely: first, it over-reached itself by so increasing the number of topics included in the course that it became impossible for the pupils to make even a faint pretense of memorizing them all; and second, the physics teachers, themselves, came to realize its inadequacy and arose in revolt and overthrew it.

The chief reasons for this inadequacy were these: (1.) It gave no unity to the course, since it failed to group the topics about the great principles of physics, and contented itself with the superficial classification of subjects under the heads, mechanics, heat, and so on. On this account, it gave little chance for the repetition which is so necessary for the successful mastery of a subject. It also furnished little perspective among the large range of topics treated. Artesian wells seemed to the learner as important as the principle of action and reaction. (2.) It took slight account of the daily lives of the pupils. Physics was a "disciplinary" subject, forsooth, like mathematics and Latin, and the more distasteful it was to the pupils, the greater the benefit derived from it. (3.) It conceived the mission of physics to be didactic—to teach the pupils the last word on each topic—rather than to help them to solve problems of their own making. Principles and facts were merely stated, explained, illustrated with strange experiments, and applied to utterly abstract problems like finding the number of dynes that would give a mass of ten grams an acceleration of ten centimeters per second per second. On this account, it failed to appeal to the pupils so that they were not motivated to act on their own initiatives.

Fortunately for the children, this encyclopedic philosophy has been, as stated, rapidly declining in influence since about 1905. There are at present, two other philosophies, very different from each other, which are striving to replace it. The physics teacher must choose between these two, since he cannot adopt both. The first of these is not so very different from the older one. Its motto may be expressed in the words: "The first course should give the pupils a general survey of the whole field of physics." In accordance with this motto, it advocates including in the first course something of everything, thereby retaining the old fallacy of too many topics. It, however, seeks to unify the topics by stringing them on the large theories and hypotheses of physics. Thus, the pressure of gases, evaporation, expansion by heat, and electrolysis are not isolated phenomena, but are nothing but the results which the normal actions of molecules and atoms would, of course, produce. The phenomena of light do not consist of the familiar facts of vision, but are evidently and simply the effects which anyone would expect electromagnetic undulations in an imponderable luminiferous ether to produce. The pupils need not learn clearly and definitely what light actually does in their daily lives, but rather must master the mechanisms which genial physicists have constructed to aid them in picturing how these effects might be brought about.

In this philosophy, the daily lives of the pupils play a relatively subordinate part. Familiar experiences are introduced after the clever mechanisms of the wily physicists have been duly set forth. For example, all matter consists of molecules in motion. When a dish of water stands on the table, the molecules of water under the

surface are more crowded together than those above the surface. At the surface water, molecules are flying off into the air and back from the air into the water. But under these conditions, more molecules fly from water into air than the reverse: hence the water gradually disappears from the dish. Heat is nothing but molecular kinetic energy. If the water is heated, evidently the kinetic energy of the water molecules is increased. They therefore disappear into the air more rapidly than before, and the dish dries up more quickly. If a bell jar be placed over the dish of water, the molecules of water cannot spread over the entire room, but are constrained to butt their heads against the jar. We should expect these impacts to produce a pressure on the inner walls of the jar. After a time, a condition is reached in which just as many molecules fly from the water into the air as fly from the air into the water. Then evaporation should cease. We find that it does so. Under these conditions, the water vapor in the jar is said to be saturated.

This second type of physics teaching thus seeks to interpret phenomena to beginners not in terms of immediate concepts like wet, dry, pounds, inches, pressure, and the like, but in terms of less immediate abstract concepts like molecule, atom, imponderable ether, and so on. Here again, the effort is made to impress on the pupils, conceptions and interpretations which may be wholly concrete to specialists in physics, but which are totally abstract to beginners, especially those of school age. For this reason, this type may be called the *theoretical or abstract philosophy*.

It will be noted that this theoretical or abstract philosophy has much in common with the older one, especially as regards method of presenting topics. It is of necessity didactic in spirit, since it proposes to impose on the pupils, not the laws and principles of physics, but a survey of the whole field, consisting in the last analysis of the theories and working hypothesis of physics. It, therefore, does not encourage originality, initiative, and creative imagination, since the system which it seeks to implant has already been worked out by the masters and is so comprehensive that the pupils have to hurry to cover it all in the allotted time. The pupils are thus very apt to pick up the terminology of the system long before the terms stand for anything really concrete to them, and they use this terminology freely to cover up their real ignorance of how best to control the forces of nature under a given set of real conditions.

In the courses of this type, you will seldom find a topic introduced by a daily experience or by a problem that arises from daily experience. Thus to the pupils real and concrete things are usually placed last under the head of applications. You will often find in these courses, topics introduced by laboratory or lecture experiments; but most of these are, for beginners, little less abstract than the dynes, atoms, and unit poles into which they are deftly resolved by the teacher. An experiment or piece of apparatus is not concrete to a pupil merely because it is made of matter; it is concrete only when it easily associates itself with the concepts and ideas already present in his mind as the result of his previous experiences.

The abstract philosophy has developed courses that are better organized than the older courses, in that they possess greater unity. They suffer, nevertheless, from many of the faults of the former, because they over-emphasize the value of physical theory to beginners, and so seek to impose a ready-made system on the pupils without justifying this procedure in advance. Whatever advantages this method may be supposed to have in preparing pupils for later work in some colleges and technical schools, the over-emphasis of physical theory carries with it an under-emphasis of the daily experiences, and this renders the courses developed by this philosophy little adapted to bringing physics close to the daily life. Those who adopt it may not expect to contribute much to the solution of the problem before us. Their work but adds weight to the demands of that vast majority of our people who must earn their livelihood by controlling the forces of their physical surroundings and solving life's practical problems in the most scientific way.

The other philosophy which is now contending with the abstract for a controlling voice in the organization of physics courses for beginners is quite different from that just discussed. This third philosophy places neither the laws and principles of physics, nor yet the theories and hypotheses of the science at the center of its system. Instead of these human interpretations of phenomena, it centers its ideas about the development to the utmost of the powers and latent abilities of that hope

of the future of our nation, the human child himself. It holds that physics does not exist in the schools for the purpose of familiarizing young people with either the laws or the theories of physics; but rather for the sake of helping the pupils to increase their powers of controlling their physical environment intelligently and of solving their life's problems rationally. If this help is wisely given, they will, of course, learn the most fundamental generalizations of physics; and they will learn them not as matters of memory for the next examination, but as matters of use for the daily life. Because of the nature of its central idea, this philosophy may be called the practical or concrete—I had almost said pragmatic philosophy.

This concrete philosophy demands a very different treatment of the subject from that developed by the other two. Its most important differences consist in introducing each topic by means of the daily experiences of the children in each class, and in discussing these topics at the outset by the methods of reasoning with which the pupils are already familiar. It thus takes the child as he is, and seeks to build upon what he already possesses of concrete materials. Signs and symbols are not introduced until a need for them has arisen and the ideas for which they stand have become fairly concrete by wide association with previous concrete ideas. This treatment thus demands an arrangement of topics that begins where that required by the other ends—namely, with the applications in daily life—and ends where the others begin—with the laws and theories of physics.

The practical philosophy lays great weight on having the pupils at the beginning of their course, work much with familiar things in ways familiar to them, and insists on their solving many problems of their own making by the method of experiment. It seeks to lead them gradually from the crude manners with which they come to the physics classes to the more refined methods with which they leave them. This method makes it possible to cover fewer principles in a given time; but, as the psychologists have conclusively proved, assures the pupils of a much greater chance of their retaining both the subject matter studied and the methods of reasoning used as real helps in solving problems in later life. In other words, the method demanded by the practical philosophy is the one that assures us of giving the greatest amount of transferable training<sup>1</sup>.

In order to fix in mind the differences among the three types of philosophy just described, the following three samples of treatment are given. They are typical of the way in which the subject of light is introduced in accordance with the three types of physical philosophy.

I. *Encyclopedic.* A luminous body is one that emits light. A medium is any substance through which light passes. A transparent body is one that obstructs light so little that we can see objects through it. A translucent body is one that lets some light pass, but not enough to render objects visible through it. An opaque body is one that does not transmit light. A ray of light is a single line of light. A pencil or beam of light is a collection of rays, which may be parallel, diverging or converging; it may be traced in a dark room into which a sunbeam is admitted by the floating particles of dust which reflect the light to the eye.

The visual angle is the angle formed at the eye by rays coming from the extremities of an object. Knowing the distance of a body, we immediately estimate its size by the visual angle.

**Laws of Light.** 1. Light passes off from a luminous body equally in all directions. 2. Light travels through a uniform medium in straight lines. 3. The intensity of light decreases as the square of the distance increases.

II. *Theoretical.* Just as sound is defined as undulations in the air, or some other medium, that produce the sensation we call sound, so light, in the same sense, consists of undulations or waves in a medium that produce the sensation called light. Physicists have agreed to call the medium which transmits light the ether. It exists everywhere, even penetrating between the molecules of ordinary matter. Little is known about its nature and the exact way in which light travels through it, but it is generally agreed that light is a wave motion in the ether, and that the vibrations are not longitudinal as in sound waves, but transverse. The trans-

<sup>1</sup>For a more detailed discussion of this point, see Mann, *The Teaching of Physics for Purposes of General Education*, chapters vii-x. N. Y. MacMillan, 1912.

verse disturbances that exist with the waves are probably not transverse physical movements of the ether, but transverse alterations in its electrical and magnetic conditions.

A transparent body is one which allows light to pass through it with so little loss that objects can easily be distinguished through it. Examples of transparent bodies are glass, air, water. A body is translucent when it transmits light so imperfectly that objects cannot be seen distinctly through it. Such bodies are horn, oiled paper, thin sheets of wood. Opaque bodies are those which transmit no light, as brick, pig iron, wooden boards. No sharp line of separation between these classes can be drawn, the classification is one of degree.

III. *Practical.* If a number of people are asked how large the moon looks, each will give a different answer. One may say that it looks as large as a dime, another that it seems as large as a saucer, while a third may say that it looks as large as a cart wheel. Then too, the moon looks larger to everyone when it is near the horizon than when it is high in the sky.

Infants reach for the moon and cry because they cannot get it. Landsmen find it very difficult to estimate the distance between two boats at sea. On the other hand, when we look at a man climbing a distant hill, he appears as but a small speck on the landscape, yet we estimate his size correctly. We even use our knowledge of the man's size to estimate the distance or actual size of the hill or the height of the trees there. Ability to estimate distances and sizes from the way things look is obtained from long practise. Let us see if we can find the reasons for these things.

When sunlight streams through the window, it traces an outline of the window on the floor. If you hold your open hand so that the sunlight falls vertically upon it, the outline of the shadow cast on the floor resembles the outline of the hand. Most of us have amused ourselves by making shadow pictures, by so placing the hands between the lamp and the wall that the shadow on the wall resembled a rabbit, a goose, a clown, or any other creature. We might draw the same outline by pivoting one end of a long straight pencil at the source of light, and moving it around the edges of the object, while the other end marked on a paper suitably placed. We can think of such a pencil as if it were the beam from a tiny search light moving about the edges of the object and tracing the outline.

When a sunbeam is allowed to enter a darkened room through a small opening, its path, as revealed by the dust particles in the air, is seen to be a straight line. Where it falls on some object it makes a bright spot. The sun, the opening, and the bright spot all lie on the same straight line; so from inside the darkened room, we can determine the direction of the sun with reference to objects in the room, by means of the line drawn from the center of the bright spot through the center of the opening. Because light travels in straight lines, we judge the direction of an object by observing the direction in which light from the object travels.

Whatever you may think of the relative merits of the three types of method just outlined, it is clear that the only way to bring physics close to daily life is to bring daily life close to physics. The only method that assures the teacher of doing this successfully, is that of the practical or concrete philosophy. It may be that other methods may be more successful when the aim is to prepare students to meet past or present college entrance requirements, or to pursue later courses in some technical school. Other methods cannot, however, compete with the concrete method when the aim of the teaching is the union of education and life. Each teacher must, therefore, choose his own aim and adapt his methods to suit it. Let me in closing, remind you of the importance of the choice. Had education and life been united long ago, the schools would not now stand discredited, nor would the demand for separate vocational schools have arisen. A union now of education and life will save the situation.

#### Syllabus for Physics.

##### I. Introduction.

##### A. Metric system.

Linear measure, units: meter, centimeter.

Square measure: centimeter only.

Cubic measure: cubic centimeter, liter.

Mass: kilogram, gram and decimal parts.

- B. States of matter. Defined and explained. Kinetic theory of matter.
- C. Properties of matter, illustrated and explained. This should include a study of the evidences of molecular motions and molecular forces in solids, liquids and gases.
- D. The moisture in the air. Including a study of conditions necessary to the formation of dew, fog, rain, snow, etc.
- E. Evaporation. The conditions affecting it and the results produced by it.

## II. Force and Motion.

- A. Forces: kinds, their measurement and graphic representation.
- B. Motion, forms. Newton's laws of motion: inertia, momentum, and reaction.
- C. Resolution of forces. Uses, applications.
- D. Moment of force, defined, explained. Parallel forces.
- E. Gravitation and Gravity.
  - 1. General law.
  - 2. Causes of variation in weight.
  - 3. Weight is proportional to mass.
  - 4. Center of gravity, how determined.
  - 5. States of equilibrium. Stability.
- F. Falling bodies.
- G. Curvilinear motion, centrifugal force.

## III. Work and Energy.

- A. Work, definition, measurement.
- B. Energy, five forms, two kinds, formulas, measurement.
- C. Power, units, relation, problems.
- D. Machines, use terms "effort" and "resistance." Mechanical advantage.
- E. Lever, three classes, applications.
- F. Wheel and Axle and Pulley, applications.
- G. Inclined plane. (Effort parallel to incline.)
- H. Efficiency and Friction. Measurement, uses.
- I. Power tests of motors and engines.

## IV. Hydrostatics.

- A. Gravity pressure: varying depth, area, density of liquids, direction, shape of vessel. Communicating vessels. Problems on rectangular areas only.
- B. Pascal's law. Areas given, applications.
- C. Laws of buoyancy.
  - 1. Archimedes' principle.
  - 2. Laws of flotation.
  - 3. Problems.
- D. Specific gravity and density.
  - 1. Specific gravity of solids. Bodies denser than water. Problems.
  - 2. Specific gravity of liquids.
    - a. Bottle method. Problems.

## V. Pneumatics.

Gas pressure due to (1) gravity, (2) molecular motion.

- A. Weight and pressure of the air.
  - 1. Evidences (qualitative).
  - 2. Measurement. Use of barometer.
- B. Relation of volume and pressure. Boyle's law.
- C. Applications: Pumps: air, lift, force, use of air dome, siphons, balloon.

## VI. Heat.

- A. Heat, definition, its sources and effects.
- B. Temperature, measurement. Thermometers, their construction and limitations.

## C. Expansion:

- a. of solids, (qualitative).
- b. of liquids, anomalous expansion of water.
- c. of gases, absolute zero. Law of Charles.

## D. Modes of Transmitting Heat.

- 1. Conduction } discussed
- 2. Convection } and
- 3. Radiation } illustrated.
- 4. Applications in heating and ventilation.

## E. Heat and Work.

- a. Mechanical equivalent.
- b. Explanation of the action of heat engines.

## F. Measurement of heat. Calorie and B. T. U. Specific heat.

## G. Change of state. Heat of fusion and vaporation.

Determination, effects, applications.

## VII. Magnetism and Static Electricity.

## A. Magnets: natural, artificial, permanent, temporary.

## B. General properties of magnets.

## C. Magnetic induction and the molecular theory of magnetism.

## D. The earth's magnetism as shown by:

- 1. Magnetic compass.
- 2. Magnetic dip and declination.
- 3. Magnetic induction of the earth.

## E. Electrification by friction, kinds of electric charges.

## F. Conduction and theories of electricity.

## G. Electrostatic induction and electric fields.

Distribution of charges.

## H. Electric condensers and capacity.

## VIII. Current Electricity.

## A. Electric circuits and conditions necessary for the production of electric currents.

## B. The simple cell, action, polarization and local action.

## C. Practical voltaic cells.

- 1. Leclanche, wet and dry. } Construction,
- 2. Daniell cell. } Action,
- } Uses.

## D. Magnetic effect of electric currents.

- 1. Electromagnet, electric bell, telegraph.
- 2. Relation between current and magnetic field.
- 3. Use in current measuring instruments: voltmeter and ammeter.

## E. Resistance and Ohm's law.

- 1. Conditions affecting resistance.
- 2. Effect of combining conductors in parallel series.
- 3. Measurement.
  - a. Volt-ammeter method.
  - b. Wheatstone bridge method.

## F. Chemical effect of an electric current.

- 1. Electrolysis of water.
- 2. Electroplating.
- 3. The storage battery.

## G. Electric power and its determination.

## H. The heat effect of electric currents.

- 1. Fuse wire.
- 2. Electric heating and cooking.
- 3. Arc and incandescent lamps.

## I. Electro-magnetic induction.

- |      |   |            |                           |
|------|---|------------|---------------------------|
|      | { | Production |                           |
| Laws | { | Intensity  | Illustrated by magnets    |
|      |   | Direction  | and coil with bar magnet. |

- J. The dynamo—two-pole field, single rotating loop or coil, alternating and direct.
- K. Simple electric motor, two poles. Efficiency of an electric motor.
- L. The induction coil and transformer. Uses. Differences.
- M. The telephone.
- N. Wireless telegraphy.
- IX. Sound.
  - A. Nature, source, speed, medium.  
Reflection of sound, echoes.
  - B. Waves and wave motion.  
Illustrated by water waves showing reflection, refraction and interference.
  - C. Characteristics of sounds.
    - 1. Intensity—conditions affecting.
    - 2. Pitch, and rate of vibration.
    - 3. Quality and overtones.
  - D. Interference, beats, discord.  
Resonance, sympathetic vibrations.
  - E. Musical scales, diatonic and tempered, uses.
  - F. Laws of vibrating strings and air columns.
  - G. Types of musical instruments.  
Vibrating 

|   |  |
|---|--|
| { | strings,<br>plates or membranes,<br>air columns. |
|---|--|
- X. Light.
  - A. Rectilinear propagation of light, speed.
    - 1. Shadows.
    - 2. Pinhole camera.
  - B. Photometry.
    - 1. Intensity of light (source) and intensity of illumination distinguished.
    - 2. Law of inverse squares.
  - C. Reflection.
    - 1. Law of reflection.
    - 2. Regular, diffused.
    - 3. Plane mirrors, position and character of image.
  - D. Refraction.
    - 1. Definition and explanation.
    - 2. Refraction of parallel-sided plates.
    - 3. Refraction by prisms and lenses.
  - E. The formation of images by lenses.
    - 1. Converging and diverging lenses.
    - 2. Position and character of images formed by converging lenses.
  - F. Optical instruments.
    - 1. Eye, camera.
    - 2. Microscope, simple, compound. Telescope.
  - G. Color and spectra.  
Dispersion, achromatic lenses. Uses of spectra.
  - H. Interference and polarization.  
The nature of light.  
Medium, length and character of waves.

Suggested List of Experiments in High School Physics.

(Twelve of the starred experiments are recommended as a minimum.)

Mechanics.

- I. Preliminary.
  - †1. Measurement of length. Compare English and metric measurements.
  - †2. Measurements of volume. (Teach use of calipers.)
  - 3. Vernier calipers.
  - 4. Micrometer calipers.

- \*5. Study of graphs. (Use graph to show the relation between English and metric units.)

## II. Mechanics of solids.

- \*6. Parallelogram of forces.  
 \*a. Problem: Crane stresses or some other practical exercise involving balanced forces acting at angles with one another.
- \*7. Parallel forces.  
 \*a. Problem: Center of gravity.
- \*8. The lever and the principle of movements.
- \*9. The inclined plane. (Efficiency of a machine.)
- \*10. The pulley. The wheel and axle. (Mechanical advantage.)
- \*11. Elasticity and Hooke's law by:  
 \*a. Calibration of a spring or by use of Jolly balance.  
 \*b. Bending rods.  
 c. Twisting rods.
12. Cohesion. The breaking strength of a wire.
13. Friction.
- \*14. Falling bodies.
- \*15. The pendulum.

## III. Mechanics of Fluids.

- \*16. Density of water. (Use of beam balance.)
- \*17. Archimedes principle.  
 a. Bodies that sink in water.  
 b. Bodies that float in water.
- \*18. Specific gravity of solids denser than water.  
 a. By a spring or beam balance.
- \*19. Specific gravity of solids less dense than water.  
 a. By a beam or spring balance.
- \*20. Specific gravity of a liquid by:  
 a. Spring or balance beam.  
 b. Specific gravity bottle.  
 c. A constant weight hydrometer.  
 d. A U tube.  
 e. A Y tube.
- \*21. Measuring air pressure. Use of a barometer.
- \*22. Measurement of pressure:  
 \*a. Of liquids at varying depths.  
 \*b. Of gas or water pressure.
- †23. Boyle's law.

### Heat.

(Five of the starred experiments are recommended as a minimum.)

- †1. Testing the fixed points of a mercury in glass thermometer.
- \*2. Relative conductivity of various solids.
- \*3. Coefficient of linear thermal expansion of a solid.
- \*4. Calorimetry. Mixing water at different temperatures and determining the thermal capacity of the calorimeter.
- \*5. Determination of specific heat by the method of mixtures.
- \*6. Determination of heat of fusion.
- \*7. Determination of heat of vaporization.
- \*8. Determination of dew point of the atmosphere.
9. a. Determination of the change of volume of a gas at constant pressure, with change of temperature.  
 b. Determination of the change of pressure of a gas at constant volume.
10. Fixing of melting and solidifying point.
- \*11. Vapor tension of alcohol.

### Electricity and Magnetism.

(Ten of the starred experiments are recommended as a minimum.)

- †1. Fundamental facts of magnets.

- †2. To map the field of a magnet.
  - a. By blue print.
  - b. By a compass.
- 3. Magnetic induction and the earth's magnetism.
- 4. Production of static electricity by friction. A study of conductors and insulators.
- 5. Electrostatic induction, condensers.
- \*6. Study of simple galvanic cells.
- \*7. Study of the magnetic field about wires carrying an electric current.
- \*8. Study of the electromagnet.
- \*9. Study of electric bell, telegraph sounder or relay.
- \*10. Study of a galvanometer or ammeter, using same in electric circuits, Ohm's law.
- 11. Study of two fluid galvanic cells.
- \*12. Study of electrolysis.
- 13. Electromotive forces of various cells by:
  - a. Use of volt-ammeter.
  - b. Use of an ammeter with a constant resistance.
- \*14. Arrangement of cells in connection with varying external resistance.
- \*15. Measurement of resistance of wires by:
  - a. Wheatstone bridge method.
  - b. Volt-ammeter method.
- \*16. A study of resistances connected in series and in parallel.
- 17. Effect of temperature upon resistance of wires.
- \*18. Electromagnetic induction.
- \*19. Study of dynamo or motor.

#### Sound.

(Three of the starred experiments are recommended as a minimum.)

- †1. Study of wave motion by use of wave trough.
- †2. Velocity of sound in air.
- †3. Wave length of sound in air.
- \*4. Number of vibrations of a tuning fork.
- \*5. Interference of sound.
- †6. Laws of vibrating strings or air columns.

#### Light.

(Six of the starred experiments are recommended as a minimum.)

- 1. Images formed by a pin-hole aperture.
- \*2. Photometry.
  - a. Study of the effect of distance upon intensity.
  - b. Comparison of intensities.
- \*3. Law of reflection, images in a plane mirror.
- \*4. Images in a concave mirror.
- 5. Images in a convex mirror.
- \*6. Study of refraction by plate, prism, lens.
- \*7. Index of refraction of glass or water.
- \*8. Determination of the principal focus of a convex lens and a study of the real and virtual images formed by it.
- \*9. Study of two of the following:
  - a. Refracting telescope.
  - b. Compound microscope.
  - c. Opera glass.
- ††10. Study of spectra.

#### Practical Applications.

The following list gives a few of the applications or illustrations of the principles involved in the various experiments or cases in which they must be taken into consideration.

## Mechanics.

## Exp. No.

6. Wind and current pressure on sails and rudder of a ship, on planes of an aeroplane, on rudder of canal boat.
7. Bridge trusses. Single and double tree.
8. Shears, nut-cracker, crowbar, nail puller, balance, steel-yard, pump-handle, boat oar, bracket, safety-valve, human arm, pincers, wheel-barrow.
9. Screw, wedge, ladders, lifting jack, screw press, gang plank, vise, screw propeller, air fan, inclined railroads.
10. Block and tackle, geared cap-stem, windlass, derrick, water wheels and turbines.
11. Spring balance, spiral springs and wagon springs. Structural beams and trusses, shafting.
12. Suspension bridge, tow lines.
13. Bearings, friction gears, belting, brakes, wheels on roadway.
14. Range of projectiles.
15. Clocks, determination of acceleration of gravity, metronome, work of bureau of standards.
17. Balloons, ships, life preservers, floating dock. Buoyancy of air.
20. Lactometers, Alcoholometers.  
Testing for adulteration of milk, oil, etc.  
Gravitational separation of liquids, cream separator.
21. Study of pumps, open manometer, siphon.
22. Construction of dams, siphon, standpipe, hydrostatic press.
23. Diving bell, caisson, closed manometer, compressed air, air brakes, bellows.

## Sound.

1. Illustration of phenomena of wave motion.  
Stationary waves, reflection, refraction, interference.
2. Acoustics of buildings.  
Organ pipes (length of) echoes.
3. Comparison of pitches, measurement of time intervals.
5. Harmony.
6. Stringed instruments.
- 3, 4, 5. Theory of music.

## Heat.

1. Calibration of thermometers. Bureau of standards, etc.
2. Great variation in conducting power of substances.
3. End rollers on bridges. Dial thermometers. Spacing of railroad rails. Compensation pendulum, balance wheel. Metallic thermometers. Thermostats.
5. Heating and ventilation. Convection currents in nature, trade winds, ocean currents.
6. Ice in refrigerator, cooling of buildings.
7. Steam heating. Steam engine. Ice making, cold storage.
8. Hydrometers, fogs, clouds, rain, snow.
9. Gas, thermometer.
10. Alloys, waxes.
5. Better understanding of heat engines.

## Light.

5. Eclipses.
1. Action of camera.
2. Comparison of light intensities.
- 3, 4, 5. Optical instruments, reflectors for vehicle lamps, search lights, etc., sextant.
6. Displacement of objects through glass  
Position or direction of immersed objects.  
Reflection by right angled prism.

## Exp. No.

- 8, 9. Optical instruments, microscopes, telescopes, collimator, eyeglasses, projection lantern, photographic camera, stereoscopes.  
 10. Spectrometer and spectrum analysis.  
 S. Saccharimeter, polariscopes.

## Electricity and Magnetism.

- 1, 2, 3. Ships compass, dipping needle, etc. Magnetic separation of metals. Magnetic charts, etc., of Bureau of Commerce and Labor.  
 4, 5. Electrometers, lightning rods, condensers, Roentgen rays, generators, etc., brush discharge from high potential lines, static charge produced by belts, grounding by combs.  
 9. Electromagnetic apparatus, sounders, relays.  
 10. Galvanometers, ammeters, voltmeters. Measurement of electric current, etc.  
 8, 9, 10. Meters.  
 16. Calculation of electric circuits, use of tables, transmission, lighting, traction system, etc.  
 17S. Safe carrying capacity.  
 S. Electric lighting, electric heating. Heating irons. Use of tables.  
 13, 14. Terminal potential of current sources.  
 18, 19. Telephone, induction coil, induction motor, dynamo, motors, transformers, electric lighting and motive power.

## SOCIAL SCIENCE SECTION.

The Social Science Section met for the morning session in the Chapel with Professor John A. Fairlie presiding. The subject for discussion was the report of the Committee of Five on Course in History. The Committee has suggested, (a) one year of English history to 1760, the course to include the essential of general European history and to be followed by (b) one year of modern history since 1648 with the essentials of English history for the last two centuries to be included in the course.

The first question under discussion was: "How far should we follow the Committee in shifting the emphasis to recent history?"

Principal F. D. Thomson, Springfield, first took up the problem and summarized his address as follows:

1. The recommendation of the Committee is in line with the recommendation of the Committee of Seven and not so radical as the former report when it was made.

2. English history may be used as a thread by which to connect the history of the ancient world with that of the present time. There is a great lack in not having some line to connect the history of the past with that of the present. This suggestion points out one way by which to overcome that difficulty.

3. By using English history for that purpose it tends to keep before the American boys and girls the principles and ideals of the English people from which our institutions have grown and developed.

4. This not only connects ancient history with our own but it gives a good foundation for the treatment of the growth and development of our own country in the expansion of the English race in the New World.

5. In curtailing the time and the topics to be treated in history the elimination should not be at the expense of the history of our own country. This treatment of modern history may take care of the colonial period in American history, thus leaving more time to the constitutional period and government of the United States.

6. Whatever other purpose we may have in teaching history in our own times and in the onward movement of democracy, unless in the presentation of history there will be no place where our young people will learn to *study* and to *understand* or interpret the important and far reaching problems involved in the social, economic, industrial and political questions of our times.

The discussion was continued by Superintendent D. B. Fager, Vandalia, who emphasized the fact that history has attained a very high place in our high school curriculum, much being due in this to the work of the Committee of Seven. The Report of the Committee of Five seems but a natural evolution out of the former report, in accordance with our social, industrial and economic needs. Recent history seems to meet a special need in our schools since our students are much more familiar with Charlemagne than they are with Bismarck or Gladstone.

The second phase of the question was, "How far is it possible to teach the essentials of medieval history under the proposed plan?" Principal Jesse H. Newlon, Decatur, first spoke as follows:

"In the history work in our secondary schools today, there are five distinct needs: (1) More carefully trained history teachers; (2) better equipment; (3) thicker text-books; (4) to cover a smaller area laterally, and make more intensive studies of significant topics; (5) to place more emphasis on the modern period. It is not the province of this paper to elaborate upon these five needs. They have all been recognized by the Committee of Five, at least implicitly if not explicitly, and upon the fifth need enumerated, the shift of emphasis to modern history, the Committee has placed its greatest emphasis. The Committee recommends that one year be devoted to medieval history, with the emphasis on English history, bringing the English narrative down to 1760, and the continental history to 1648. The question is: "Can medieval history be taught under this scheme?"

If there is to be more time devoted to modern history, it is evident that the cut must fall most heavily upon the medieval period. It is not possible, if desirable, to shorten the year devoted to American history. Ancient history extended to 800 A. D., or thereabouts is spreading it on about as thin as is possible there. Can medieval history be taught well enough to justify this scheme?

It is evident on the start that if the work is to be any more than a mere cramming process, there must be an elimination of much that is now generally included in medieval history in favor of a more intensive study of the more important institutions and movements. This should be done anyway not only in medieval

history, but in every field. This does not mean that less history would be taught. It means that history would be better taught and more meaningful to both student and teacher. Altogether too much time is now devoted to the details of such topics as the Investiture Conflict, or the jumble of the later Carolingian period, or to Scandinavian history, or to tracing the history of France or Spain, reign by reign, or trying to unravel all the intricacies of the Thirty Years War. Altogether too much time is now wasted in mere memory work which is forgotten soon after the final examination and usually before. Nor does this mean that no dates are to be learned, nor details to be mastered. Dates and detail must have settings if they are to be remembered. Enough dates will be learned and a vast deal more of information carried away.

Indeed when I read over the list of topics which the Committee of Five thinks can be handled in one year even under the new schedule I was staggered by the list. There needs to be time for the student to do the reading and study necessary to get into the spirit of any period or institution and to afford the opportunity to give him that training in the use of books, in criticism, and in thinking which the study of history is so peculiarly adapted to giving. We are, in the words of the Committee, trying to spread it all over with equal thickness and hence we are not obtaining these things.

I believe that in this year's work under the new schedule the first thing to do would be to select a few big things to emphasize in English history. This will mean a firm resolution here as elsewhere to cut certain periods. The War of the Roses, for instance, should be dismissed with less than a day's work, and little attempt should be made to master the political history of the Early Saxon Period. It will be found that many time-saving cuts can be made that will not only not injure, but really improve the character of the work. After this process of elimination is complete, we will have left certain large topics and the field will be divided into five or six periods denoted by large movements. It will then be found that certain of the large topics are topics of general European history, such as the medieval church, crusades, feudalism, rise of cities, medieval culture, the Renaissance, the Reformation, the religious wars. What else is there that is significant which needs to be brought in? Very little. A more detailed study of Charlemagne's empire, the growth of a centralized French nation, a description of the Holy Roman Empire and the disorganized condition of Germany in the Middle Ages will almost cover the ground which cannot be reached under some of the topics named above. Now this may seem a paucity. But if you will allow that all along just such European history, other than the topics mentioned above, is to be introduced as to explain clearly English history, I am ready to defend my thesis.

I believe, in other words, that under this plan, two years work could be done that would be far better than the two years now devoted, one to medieval and modern, and one to English, and that medieval history could be taught better under this scheme than it is now taught. I mean by this, that the great medieval period would be more significant to the pupil, that it would explain more things in modern life, and that the child would get through an intensive study of more limited fields, more enjoyment from his work which would mean that he would retain it longer, and carry away what he seldom does at the present time, a taste for historical reading. Moreover, he would not carry away as he so generally does today the impression that English and medieval history are two different compartments separated by a thick stone wall. We would really study medieval history.

Now I do not mean to say that with the present arrangement of time which in all schools is that recommended by the Committee of Seven better work could not be done than could be done under the proposed plan. Theoretically one semester is now devoted entirely to medieval history. As a matter of fact, every high school man knows that in nine cases out of ten, considerably more than a semester in actually devoted to it. But I maintain that so much of this time is now wasted in the majority of cases, that, with proper teaching, even with the limited amount of time under the proposed plan, better actual results could be obtained than are now being obtained and that sufficiently good results could be obtained to warrant the change.

But this supposes ideal conditions: (1.) It would mean a teacher capable of grasping the problem, one who could weave the history of continental Europe in

with that of England, who could make the little side excursion and get back again without getting lost, one, in a word who could give to the whole coherence and continuity. (2.) It would mean in all probability, that there would need to be new texts provided. (3.) In any case, it would mean better equipment in the way of libraries and maps, and, by the way, if this new course would serve merely to get liberal appropriation for reference books, it would have no small merit for this is a crying need today in our high schools both small and large. The quality of our history teaching is improving far more rapidly than the quality of our historical libraries. Indeed I raise the question as to whether in the smaller school, this course could be followed at all, with the present equipment.

Although it is outside the realm of this paper, yet on account of the pertinence of the question, I cannot forbear mentioning one other difficulty which presents itself. In many of the high schools, only one year of history is required. Would it be desirable for a student to elect this year of work and leave him stranded in England in 1760, or in Europe in 1648? On the other hand, could he be jumped into modern history at this time, and be expected to understand the course of events. The answer is, I suppose, that we should require two years of history and make it the two years of European history. There are many problems to be taken into consideration in a high school with a complex and highly differentiated course of study, but I am inclined to believe the answer is correct.

Where two years are required, it will probably be found that very few students in this course will have had ancient history. The suggestion of the Committee that a short time, say from four to eight weeks, should be spent mainly in telling the student about the life of the ancients, is a good one, for some appreciation of these peoples is absolutely essential to an intelligent grasp of medieval history. In this case, however, it would be impossible to reach the limits set by the Committee of Five. More of the work would have to be left to the year in modern history.

To summarize: (1.) As far as medieval history is concerned, it can be taught well enough under this plan to justify its adoption. (2.) Under the proper conditions, it can be taught even better than it is generally taught at the present time. (3.) But lack of equipment and of texts, and in many cases, of properly trained teachers, will render it impractical in small schools at the present time. (4.) It will be impractical in schools where only one year of history is required."

The discussion was continued by Jessie McHarry, Rantoul, as follows:

"The problems which the discussion of the proposed plan has brought up, so far as medieval history is concerned seem to be these: Are English history and general European history so closely related in subject matter, that they can best be taught the one supplementary to the other? Are the conditions in our schools such that it will be possible to give our pupils a broader historical knowledge under the proposed plan than we now give them? Or, in other words, will this plan be handicapped by the lack of ability of our teachers and the unavailability of the necessary reference books?

So far as the subject matter is concerned, when one studies medieval history in search of the general tendencies of the succeeding era, the whole field seems to divide itself very well into just such topics as foundation, the mediæval church, crusades, rise of monarchic states, economic conditions, and the Renaissance. Our problem is this: "Can these subjects from the European standpoint be given adequate treatment in connection with English history?" After an examination of English history, one might well ask: "Can our English history be taught effectively without a careful understanding of the broader European problems?" When our pupils study English history, we can usually assume that they have a basis of general European history from previous work. But the fact is true that even after very effective teaching, the instructor of English history finds that a large part of time must be spent in reviving old perceptions and reviewing old problems before the English movements can be comprehended. The present system seems a waste of time, since it means a study of the mediæval period twice with a separate treatment for both Europe and England, with little serious consideration in establishing a connection.

Since the general topics of English history seem to be identical with those in medieval, the teacher will have little trouble in handling his subject matter. When the teacher can make his pupils realize that the invasions of Danes and the Norman Conquest in 1066, are nothing more than mere fractions of Northmen invasions similar to those which peopled Iceland, Russia and France, he can, by a detailed study of one invasion, give an organized body of facts which can be remembered.

Feudalism may as well be studied in England as in France. If it seems there, in some of its phases, a departure from the ideal system, the rule will be remembered the more easily after the exception has been seen. The medieval church must be understood before any pupil could be expected to comprehend the clash of its power with that of Henry II and John. Of our general topics, there remain the Crusades, the Renaissance and economic conditions, each one of which has a vital connection with English history and which cannot be neglected if English history is properly taught. There are very few, if any, essential topics in European history which would be omitted if the natural connection were studied. Even the growth of the French nation, and the disorganized condition of Germany would fit in very well with the growth of the English nation as illustrative of the rise of monarchic states. The English nation will be better understood when compared with similar growths in France, and the lack of organization in Germany.

Besides the fact that the subject matter of the two fields are so closely related, there is an added argument in favor of teaching them together. Under the present system if we reinforce the general phases of our medieval or modern history with sufficient detail to enable our pupils to remember them, we find our time is gone and our work unfinished. By combining the general problems of medieval and English history, one can make use of the facts of the latter for the necessary illustrative details for the former.

Since English history seems to fill in a need felt in teaching medieval history without infringing on time; and medieval history seems to fill in the necessary background for the English history work, it seems but a natural economy to teach our mediaeval work in connection with English history. The point was well made that perhaps all of our history teachers would not be able to eliminate or subordinate the events which were not influential in determining world wide movements. This may be true, but the fact remains that most of our teachers can work out ideas well which have been organized for them. Would they not be able to teach under the proposed plan if a syllabus were planned by some of our leaders, which would outline the topics under which English history could be taught effectively, with the suggestions for related facts and comparisons in the European field? With such a guide, work might be done even with the very few reference books some of us must work with in our smaller schools. If this plan really is an economy of time, and would leave a more lasting impression of closely related facts it should be made practical for all, especially for the smaller schools which are most in need of aid.

In conclusion: The plan seems to be a good one, and mediaeval history could be adequately treated under a plan which would so organize English history as to bring out its general eras, and its close connection with Europe. If the present syllabi and texts are not adequate, the case is not hopeless; but merely another opportunity for making our work more effective is offered."

The third topic for discussion was, "How will the adoption of the plan affect the teaching of English History?" Miss Bess Ellen Drew, Joliet, gave the following paper.

"Since history is not a required subject in our high school, and since two-fifths of those in our English history classes have had no medieval history, in order not only to prepare intelligently for a following course, but also to make English history properly understood, we have in reality been forced into an adoption of some such plan as the Committee of Five suggests.

The position of England in world history is not unlike that of the Christ in the famous picture, "Christ before Pilate." Although the central figure itself is striking and tells its own story, still the full meaning of the artist is brought out

only when we take into consideration, the back ground, the setting of Jewish hatred and Roman authority.

The analogy between the picture and history is easily drawn. England is the central figure, and collateral European conditions are merely the back ground, and we must keep them in the back ground, if we would avoid the confusion which attends the teaching of general history. Let us always keep in mind that we are dealing with boys and girls.

Our aim in blacking in our setting, is to introduce as few, as telling and as closely connected events and conditions as possible. For the proposed course, such have been well indicated to you.

The choice made, our next step is to present such events and conditions as fittingly, as vividly, and as concisely as possible. In this paper, regardless of whatever faults may lurk about the means employed, we shall try to give some idea of our presentation of a typical few of those events and conditions.

Without comment, let us say that our first study is a rapid survey of place-geography, and of the physical features of Europe and the British Isles. On the board, directly before the class, is a map of Europe and the British Isles, together with Asia Minor and northern Africa. It is a white painted outline, with the great rivers and the modern national divisions faintly indicated. Nothing could be better for a recitation on place geography, and place geography is only one of the recommendations for such a geographical representation. Since the map outline is painted on the wall, it is permanent, and because of this fact, it is used constantly, so that all events become associated in some way with the same map, and it answers as well to that concrete something to which it seems so necessary to pin-locations.

For the physical features of our study, the class makes a rough relief of the same map in clay, of the non-hardening kind used in leather modeling and tooling. A mechanical drawing pupil, and one is usually in the class, is given a book map to enlarge, one foot to one inch, and is asked to include only the important rivers and boundaries. That done, the countries are separated into sections, much as one would cut a picture puzzle, and these sections are divided among the pupils of the class. Each pupil builds the clay model of his section, regulating the height by a given scale, and he is informed at that time that throughout the course he is to be the class authority on everything pertaining to that country. When the parts are finished, the whole is fitted together on a plane. The board can be raised easily at an angle of 70°. A brief generalized discussion follows.

We touch this work by touching upon the prehistoric races. At the time when these peoples step into history in the Bronze Age, attention is centered upon the Celt of Britain. A picture of the Celt, as well as of Caesar's invasion, comes vividly with the reading aloud of that part of Edwin Arnold's *Phra, the Phoenician*, in which they are portrayed. A source reference is easily introduced here. In his tent, when Caesar talks with Phra, he jots down the information gained from him. An extract from the commentaries is acceptably apropos.

The Romanizing of the province begun by Agricola requires some information upon the Empire at its height. This need not take much time. Throughout a course, if possible, and usually it is possible, teach by creating pictures. A well developed image, consisting of sight, sound and kinesthetic sensations will remain longer with a boy than a dozen abstract ideas associated merely with drill. Let a pupil imagine himself taken to Rome for a Claudian triumph. Let him describe the roads and villas passed on the way to the Eternal City. Then let another prepare to continue the description, picturing the city with its public buildings, the celebration itself, the people moving about to see it, the official, their clothes, their actions. After the triumph, have the slave live in a villa and let him give you typical scenes from his life there. You can aid by the use of pictures and lantern slides showing different phases of Roman life and views of Roman buildings. When using pictures and slides, may we just here advise the use of fewer "ruins," and more "restorations." The ideal way may be to present both, but with young people if you have to choose, decide upon the latter. Some present day views of Rome are as fruitless to a boy's imagination, as the building of a turkey around a drum stick would be to an Eskimo. A restored forum has life as well as form.

If a test of the information acquired by the above means of handling a subject seems necessary, require from the pupils an outline contrasting the civilization that your student was supposed to represent with that that he has so described. If experience counts, the results may be guaranteed good.

At the time of the early Saxon settlements, and the withdrawal of the Roman troops, we review as well the migrations of the other Germans. Each boy and girl prepares a chart of these migrations. At class time, using colored crayons, we depict the subject on the painted outline. The extent of the location where each tribe makes its kingdom is dotted over with chalk of the color chosen for that tribe. When the invasions are finished, our map resembles that of Europe at the time of Theodoric. Dates are written along the routes (a century is roughly estimated as the age of the government of the U. S. up to the time of the birth of the pupil, so some idea of the extent of time is included). Another use is now found for the clay map. Following the colors on the board, bead headed pins are used to line the routes. Each line or band has larger pins to which are given the leaders' names. If a place is taken, or a battle fought, upon the spot, the victorious leader has the privilege of having set up a tiny paper flag of his color with the historic date written upon it. For example: the West Goths are red pins, and the imperial color is purple. Adrianople is marked with a red flag bearing the date 378 A. D. At the foot of this flag lies a big purple beaded pin, an indication that the emperor was slain in the encounter. A similar banner, marked 410, would fly over Rome. Near Rome, a black pin enters the red line—Alaric has died, and the band wanders on without him. In Spain, the reds come in contact with the yellow Vandals; a crimson banner on a purple pin indicates that the Empire has granted the territory to the Goths. The yellow line moves on to Africa, and Spain floats Euric's red flag. The Huns, being neither German nor permanent, are indicated merely by pin pricks on the clay of Europe. When the lines of march are finished, the migrations are concretely before the class at a glance, and an image is created which will remain in the imagination, and can be called into historical use at any time.

The crusades can be taught in much the same way. Fallen pins by the way-side tell a vivid story. For the Northmen, too, the clay answers well. When settlements are made in places not represented, you can supply the additional information by means of a brief talk.

After a short review of the conquest and kingdom of the Franks, we concentrate our attention upon our special barbarian, the Anglo-Saxon.

No matter what task is before us, the Anglo-Saxon is not to be slighted. It is his sacred right to be made a living being. A careful study is made of these English, the race elements, and the characteristics as seen in political and social organizations, the blood wite, the blood bond, land holding. Each pupil reads Tacitus or Green, and then draws a plan of a township. The majority vote of the class decides upon the plan to be used for the model of a tun.

A tray (four feet by three), sand, clay, small twigs, a box of toothpicks, and the necessary material for such a miniature village is at hand. Of course you can have such a luxury as mirrored waters, but we are content with necessities. The chief features to be brought out by model are: the isolation and independence of each freeman within the settlement, as well as the isolation of settlement from settlement, the mark, the homestead of the ceorls, and the larger holdings of the earls, common land and the moot hill. During the year, each girl dresses a doll, and here the "weaponed man," the "long-haired, Saxon freeman" is most timely useful. It might be added that we carry on a tungemot, a shire, and a witan meeting so as to bring out the personnel and powers of the same.

Europe is before the class, a step to the board, a matter of ten minutes and the habits and spirit of the European barbarians can be touched upon, as well as can be brought out the temporary submergence of Greek and Roman civilization.

Another model which is most valuable is that of a feudal castle. Medieval life centers about it from tilting yard to keep. Surround the castle with a carefully planned estate; or, assault it, and feudalism is made picturesque. Contrast feudalism on the continent with that in Norman England to connect and to complete the subject. The castle and the monastic estate may form as well a part of your work on the rise of towns.

The reintroduction of Christianity by Augustine should be prefaced by a study of the church up to the time of Gregory; its organization, the rise of the papacy, and of monasticism. In handling Christianity, my first, and always a necessary step, is to impress upon the pupils that up to the 16th century the term is synonymous with Catholicism. Every pupil has for the course special references. The seventh century organization of the Catholic Church from priest to pope, together with the naming of the first pope, is given, if possible, to a Catholic child, since he will be personally interested. This organization is outlined on the board, and references and developing topics for the rise of the papacy are given. Besides answering all questions briefly, each pupil is assigned a special topic, so that when all the assignments are put together, a fairly full study of the subject is obtained. Then a review of the whole subject, outline and topic is assigned for the following day's work. Gregory's civil and religious duties, in addition to his missionary activities, receive special attention; the last mentioned bringing us back to Augustine and monasticism.

Our desire in dealing with the monk is to make him a creature of flesh and blood. He is always interesting in his goodness; yes, and in his badness there is a charm about him. So we follow him about from chapel to cell, whether he be tilling the field, copying in the scriptorium, building his abbey, or collecting feudal dues; his support of the papacy, his novitiate, his habits and his tonsure, nothing is private. Views of monastic buildings as a group, each taken separately, inside and out, are shown by means of pictures and lantern slides. Stories of monastic life are read by the student; for these additional credit is given. When a great man of any order steps into our path he is assigned his niche among the regular clergy as well as in an additional activity. The monk is a vital factor throughout the Middle Ages.

Time alone, prevents more than a passing glance at the brother on the continent, but that, together with the similar activities of the English monk, permits of some idea of the extensiveness and vitality of monasticism.

The Norman kings not only link England to France, but they open a way for a discussion of the papal versus temporal authority. We usually present such a topic in the form of a talk, questioning and restating until an understanding seems assured. We may err here, but troubles between Germany and the papacy receive no more than a brief statement. Henry IV at Canossa, is made merely an example of the height to which Gregory succeeded in carrying the doctrine that if the soul is greater than the body, spiritual things are greater than the temporal things, and the representative of the spiritual is therefore greater than the representative of the temporal.

So it was his prerogative as God's vicar to dictate the policy of kings. John's complete subserviency to Innocent, marks the period when the authority of the medieval church was at its height.

As far back as the twelfth century, we begin to prepare for the Reformation, keeping track as they appear of church powers that would tend toward worldliness, corruption and abuses. We watch for tendencies in the church itself to correct such corruption, and we discover an attitude on the part of many people throughout Europe to be disloyal to the system. The teacher is kept busy. She calls attention to, and asks for comments upon the probable effect of simony, of the raising of such men as Flambard to feudal bishoprics. She points out that heresy must exist noticeably both in England and in Aragon, or the kings of those countries would not struggle with law and arms against it. Thus for two hundred years, increasing worldliness on the part of the church and increasing dissatisfaction on the part of many of the people is in the pupil's mind, so that there can be little abruptness felt in Wycliffe's bold attack upon the papacy itself. The fact that English heresy is not only defended, but strengthened by John Huss when Wycliffe's works reach that Bohemian reformer, indicates something of the widespread discontent. Cosmopolitan Erasmus adds another link to the chain that binds England together with the continent, as well as another scholar to the movement of purification.

Henry VIII's attack upon Luther necessitates some knowledge of the Reformation in Germany. As with all connected topics, only the high places can be touched, and we attempt to cover these important steps by means of a talk by the teacher. When the English church separates from Rome, we contrast the different phases

of the Reformation, thus shown in England and on the continent. The progress of this great movement involves England with all parts of western Europe, one after another, or sometimes with several at once.

There is no need to go into a minute discussion of all of the great events and conditions on the continent. That can be introduced in connection with the history of England. The Committee has given you an admirable outline of the main points, and we have tried merely to show how, because forced by circumstances to do so, we are teaching by some such plan, albeit, by one we admit not so extensive as the sought for change would necessitate. However, for the sake of the present day history plan, we are willing, and believe that by another breath taking effort, we can extend the course to meet the colossal demand, covering 17 centuries of achievement, made by the Committee of Five."

The discussion was concluded by Principal Eston V. Tubbs, Township High School, Centralia, who spoke as follows:

No subject in the high school curriculum has undergone more radical changes in methods of presentation within the last few years, than that of history. Our ideas of functions and the aims to be accomplished in the teaching of history are constantly changing. The view-point of yesterday is not acceptable today, nor will the recommendations and pronouncements of the leaders of thought conform with the ideas and purposes of tomorrow.

A few years ago, the study of history was confined almost exclusively to those whose business it was to govern. Later it was looked upon as par excellence the hand-maid of culture. Today, the overmastering idea is to interpret the past in terms of the present. In a nation such as ours, it is vitally important, that our future citizens should receive that instruction in history, the nature and content of which will enable them to properly react to the great complexity and interrelationships of modern civilization. Every history text, for American high school students should contribute to give them a clearer understanding of the many forces which play about them in everyday life so that they will be better able to adjust themselves to their environment. The critical periods and crises, so far as they are concerned, are before them now in the throbbing, pulsant, present or will be forced irresistably upon them in the future. In the words of the Committee of Five, history should teach the pupil how "the toil and labor of the past generations made the present." With this as a working basis, let us now consider for a few moments, the recommendations of the Committee relative to the teaching of English and European history.

As stated on page 53 of the report, the point of emphasis has been shifted in the teaching of European history since the report of the Committee of Seven. There is a greater insistence that more time should be devoted to the study of modern history. When we consider that people have lived more in the last hundred years than they did the preceding thousand years, we see the whole subject in an entirely different aspect. Looking at the problem from this standpoint, the stereotyped custom of laying as much stress and devoting as much time to the Middle Ages as we do to modern Europe appears preposterous. We may lack a proper perspective in our study of the present, but this is no excuse for disregarding or ignoring modern history. The best we can do, even under the most favorable circumstances, is to get an approximation of exactness of perspective. Even ancient history is undergoing constant change and modification. Taking Ranke's working principle "*wie es eigentlich gewesen*" as our guide, we can, in a measure at least, get that objectivity which is so necessary in all historical writing. Teachers of modern history can undoubtedly testify to the deplorable deficiencies of high school students in both European and American history. The statements of the Committee in this connection are not, in the least, overdrawn. The underlying causes which prompted these recommendations are fundamental and demand attention. No teacher who is at all cognizant of conditions as they obtain at present will take issue with the Committee on this point.

The recommendation with which we are concerned, is to be found on page 64 of the report. The work of the second year is to "bring the main line of English development to about 1760, including as far as possible or convenient, the chief facts of general European history, especially before the seventeenth century, and give something of the colonial history of America." The moment we undertake to include or incorporate in English history, the heterogeneous subject matter herein recommended, assuming that the mechanical arrangement will be on the same general plan as that now followed in the writing of our history texts, that moment we will be confronted with this difficulty; instead of unity we shall have disunity. The thread of English history will be broken. In the place of order, we shall have chaos. What will be gained in one direction will be lost in another. There will be such a kaleidoscopic succession of material differing somewhat in time and radically in place that the immature student will be left in a state of hopeless bewilderment and confusion.

If the plan as suggested is to be followed, we will have to assume that the teacher is unusually well prepared to teach both English and medieval and modern history. The subject of history has suffered great indignities in the past at the hands of school superintendents and teachers. Other departments of high school work have been favored with lavish expenditures for equipment and trained teachers; but that of history has been subjected to great violence. It has been driven from pillar to post so long that a change of attitude would be not only regaling, but highly beneficial. School supervisors have been laboring under the delusion that any teacher endowed with ordinary intelligence could teach history even though she had had no special preparation in the subject. No one would think of asking his Latin teacher to teach physics or chemistry unless she had included this work in her college course. But with history, it has been considered a different matter. Until within the last few years, not many high school principals would hesitate to assign the history work to anyone of his teachers who lacked a subject or two of having enough work to fill out their schedule, regardless of what their training had been. The success or failure of the plan for the second and third years' work as recommended by the Committee, depends in a very large measure upon the preparation of the teacher and inasmuch as no syllabus has been prepared to aid the teacher, the task which confronts her becomes doubly difficult.

There are two difficult problems in the teaching of history that demand attention in connection with any contemplated changes in methods of presentation. The first, is to devise some means whereby the student will be able to get something like an adequate understanding of correlative time. Secondly, an earnest effort must be made to develop within the pupil's mind at least a glimmering of an idea of the importance of proportion, a nice weighing of influences and results. Is it too much to expect high school students to know that the battle of Chalons was fought at the time the Anglo-Saxon invasion was in progress; that while the Teutonic invaders were engaged in civil strife for supremacy in England, the great issue as to whether Europe was to be Mohammedan or Christian was being settled in the life-and-death struggle at Tours? Is it unreasonable to insist upon their knowing that when the Hundred Years' War was drawing to a close, events of profound significance were taking place in southeastern Europe; that the Thirty Years' War was partly contemporaneous with the Great Rebellion in England or that Peter the Great was making himself master of Russia in the same year that the Bill of Rights was passed? The idea of a close correlation between English and the leading facts in European history is in perfect harmony with the very general practise of correlating some one subject with another in the high school program: agriculture with chemistry and botany; physiology with zoology; mathematics with physics; American history with civics, et cetera.

According to the recommendation of the Committee of Seven, European history is to be taught in the second year of the high school course and English history in the third. Teaching these two blocks separately, as has been our wont in the past, immature students become obsessed with the idea that English history is something separate and distinct from European; that in its "splendid isolation" this nation has worked out its own destiny uninfluenced by events on the continent. Some of our English histories fail so miserably in balance and proportion, that it is little wonder

our high school boys and girls are so lamentably weak in these two particulars. By studying English history written from the English standpoint, an exaggerated and disproportionate view of England's importance is the inevitable result. To be a little more concrete, the student must be made to see the Anglo-Saxon invasions beginning in 449 not as a circumstance in itself, but as a mere incident in a great migratory movement that was taking place on the continent from 330 to 455. Later, an explanation of the feudal system in England must be supplemented by a fuller treatment of continental feudalism. The contest between William the Conqueror and the papacy can be greatly clarified by paralleling his experiences with those of William IV of Germany. The crusades, so far as England was concerned, can be viewed in their proper perspective, only by seeing them as essentially a great continental movement, and not distinctively English as a good many high school pupils think of them. Medieval commerce, the Reformation, the Renaissance, the growth of democratic institutions, and other great epochal movements mentioned in the report should be treated in the same manner.

In the main, I think we will all agree with the recommendations of the Committee relative to the teaching of English and European history. The plan as outlined is feasible, and is supported by the most recent trend in scholarly investigation. In order to avoid some of the difficulties which, in my opinion, will surely arise in the work of correlating English and European history, I should like to suggest a plan which will satisfy the conditions embodied in the recommendations of the Committee of Five, and will at the same time enable the student to get some idea as to correlative time and proportion. It is an attempt to give to history that spatial continuity, or as the historian Bury puts it, "sub specie ubiquitatis," that is so difficult for the high school student to comprehend.

In order to fulfil the above conditions, it will be necessary to effect a radical change in the plan of the history text. By a synchronic arrangement, the unity of English history could be preserved entire by writing it on the even numbered pages of the book. The main facts in European history are to come in their proper place in point of time on the odd numbered pages. The first few odd numbered pages will be entirely blank or may be filled in with pictures, diagrams, or maps. Source material might also be included which would be an aid to ready reference, and would obviate the reduplication of reference books. This will also afford an opportunity for a comparative study of pictures of a similar nature illustrative of England and the continent. Even if the odd numbered pages are left blank, where events on the continent are not sufficiently important to be brought in, the student cannot fail to be impressed with the fact that at this particular time, there was nothing of very great importance taking place in Europe. This, although a negative aspect, is a significant factor in fixing the concept of correlative time in the mind of the pupil. The following two pages which will illustrate the plan, are taken from a synchronic outline based upon Cheney, *Short History of England*; West, *Ancient World*; and Robinson, *History of Western Europe*.

### A Short History Of England

By E. P. Cheney.

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23. Of the various barbarous enemies that ravaged the province of Britain during the fourth and fifth centuries, the Picts and Scots made no permanent settlement, and may therefore be left without further notice. On the other hand, the invaders that came by sea from the continent of Europe gradually became not only marauders, but conquerors and settlers. The Teutonic tribes that occupied the northwestern coast of Europe had long been in the habit of making forays into the cultivated provinces of the Roman Empire. Time and time again, following the coasts of what are now Holland and Belgium, till they came in sight of the white cliffs of Britain, they passed across the strait to the island, then made their way either northward along the east coast or westward along the south coast, rowing into some river mouth or landing on some unwatched beach and ravaging the adjoining country. During the period of decay of Roman Britain, their invasions became more frequent and their numbers greater. These marauders were principally Angles, Saxons, Frisians and Jutes, coming from the sea coast of the Netherlands, northwestern Germany, and southern Denmark.

At some time during this period, they began to settle in the land they had formerly merely ravaged. According to an old tradition, when the Britons were especially hard pressed by the Picts and Scots, they invited the sea rovers in to defend them, giving them land for

#### European History.

407. Withdrawal, of Roman Legions from Britain. West, *Ancient World*.

In 408, the Roman legions were withdrawn from Britain to defend Italy against Alaric, and, to the dismay of the inhabitants, that island was abandoned by the imperial government.

410. Sack of Rome by Alaric.

449. Invasions by Angles, Saxons, Frisians, and Jutes.

It will be seen by the illustration that the first three chapters of English history, are not written out in full as they are in the text, but are taken from the table of contents. The fourth chapter is devoted to Early Saxon England (400-830). In this connection, the student should be made to understand why the Roman legions were withdrawn from England in 407. Here is the place where he is to be impressed with the fact that the Anglo Saxon invasion was a mere incident of a great seething unrest in Europe from 330 to 455. This is well illustrated by the map between pages 26 and 27 in Robinson, *History of Western Europe*, and that between pages 494 and 495 in West, *Ancient World*.

Likewise the other great movements on the continent which in any way effected the general course of events in England, can be placed in their proper perspective by the same means as was employed in the treatment of the migrations. As recommended by the Committee, the leading facts in European, history such as the Mohammedan Hegira, the Battle of Tours, the Treaty of Verdun, etc., might be included although they do not have a direct bearing on English history. The parallel can be carried out very effectively down to 1760. After this date, the order is to be reversed. The emphasis is shifted from English to European history. Although the influences which have been so potent in American history had their inception before 1760, England has played a leading role in world politics from that date down to the present time, and the material relating to England need not be brief or scanty, the conciseness or fulness might be regulated as circumstances dictate.

In summing up, we claim the following merits for the plan as suggested:

1. The unity of English and European history will be preserved.
2. The student will be able to get some idea as to correlative time.
3. Events will appear in their true relation to one another.
4. The idea of proportion can be carried out.
5. It will give spatial continuity to the study of history.

A general discussion followed in which Professor Ford pointed out the fact that the fundamental idea of the Committee of Five was, the importance of modern history. It came as a demand of the student and the question is do we agree? If the idea seems a good one the next point is:

(1) Can it be done? Can modern history be taught to secure what we should gain from history or are we too much in the midst of things? Have we the teachers who are able to teach the modern field? No other phase of history is so hard to be handled.

(2) The second question is: "Can the medieval and English field be correlated? It can be done, if we have the teachers and equipment. To correlate one must (1) draw parallels, (2) make contrasts. No other methods carry greater dangers. Professor Larson questioned whether 1760 was the correct dividing line.

The general discussion brought out the two ideals of history teaching: (1) Are we to learn events that have happened; or (2) Are we to learn what the centuries have achieved? The emphasis on modern history was championed by Harriet King, Oak Park, F. D. Thomson, Springfield, and W. D. Waldrip, Decatur.

The afternoon Session of Social Science Section was presided over by Chairman Dodd.

Dr. S. J. Buck opened the meeting by a discussion of the work of the Illinois Historical Survey and its relation to history teaching. He pointed out the fact that no scholarly comprehensive history of Illinois was possible without an extensive knowledge of local history. The teacher could aid in this by (1) making a search for local material of interest such as letters, diaries, and journals; or old newspaper files are especially desirable. (2) or by arousing interest through the organization of a county historical society.

Mr. L. Lyon, Township High School, Joliet, opened the discussion of the topic: "The essentials in a high school course on civil government; the problem of emphasis and elimination," by the following paper:

"In a country professing to a people's government, it will probably pass as axiomatic that all public education must contribute to the making of useful citizens. Latin, algebra, and biology, domestic science, drawing, and chemistry must make such an offering, or plead guilty to imposition.

Civics, too, must make its donation to the sum of education, or hold its place in a rational curriculum only through charity.

But it is neither wise nor reasonable to expect too much from a one semester course in civics. A writer in a recent number of one of America's most widely circulated weeklies, following the popular tendency to muck-rake education, attacks what he calls "the 'cultural' hodgepodge of useless and isolated information, that is

now labeled civics and history." He suggests that we substitute a study of housing conditions, the effects of child labor, and a list of other matters more or less miscellaneous.

I believe that the author has scented a danger. There is a danger that we make the civics work a miscellany of information, and nothing more. Doubtless the course is sometimes like the *Child's Book of Facts* in which a thousand and one questions are answered; but in which the child is taught to answer none for himself. But the demand which the gentleman makes is ill-considered. Five months are far too short in which to give all the information, much less, instill all the qualities necessary to efficient citizenship. Patriotism, what kind of a tariff is best, and how the other half lives, are all matters related to questions of government; and yet the first is ethical, the second economic, and the third sociological. I would not imply that they are not important. They are all vital questions. But they can more properly be presented in other courses. They are in the class of things that merely *can* be taught in a course on civil government. Therefore, they and their kind, if not eliminated from the semester course in civics, must be so far subordinated as is necessary to allow proper emphasis upon what civics *must* teach.

Now what civics *must* teach, pertains, I believe, to matters innately governmental. And it must emphasize, fundamentally, *not facts*—not even governmental facts—but *ideas*. In brief, the donation to the sum total of public education which may be fairly demanded of a one semester course in civil government, is a two fold one: It must give the student certain definite ideas of the nature of American government; it must give him an interest in governmental affairs.

There is no typical feature of American government with which the student must be impressed more strongly, than that *the people rule*. If your experience has, in any way, paralleled mine, ten out of every ten of your beginning students in this subject, have replied to your query as to what government was, "government is the thing that rules" or "government is the officers that keep us in order." Rare indeed, is the student who has even a glimmering that our various grades of government are agents for service; servants, for our use or discharge; mere machines for use, repair or the junk pile.

The pupils have never considered the question. They are merely reflecting a settled prevailing sentiment. That is what makes their answer so pertinent. Somehow, someway, simply as a natural absorption from their human environment, they have arrived at a working notion of government, scarcely more advanced than the divine right of kings.

The trouble, obviously, lies in the training of the present voters as to the nature of our government. They are not strongly enough impressed with the rightful characteristic of American government to be impelled to action when their rights are usurped. Most of us *see* the truth easily, but the truth is not part of us. There is more cynicism than mirth in the caricature of Mr. Common People as a chinless non-entity. There is too much fact for pleasure in the politician's jocose declaration, that "the people are his meat."

As an indispensable step, then, in the teaching of civics, this beginner's view of the nature of government must be righted. Judging from experience, it is not enough that the pupils "*see* the difference." So far as possible they should come to *feel* the difference; feel it so strongly, that unthinkingly, they come to regard the citizen and the official respectively, as master and man.

I admit willingly, that the attempt to teach this, or other characteristics of government, is an attempt to teach abstractions, and that success will not attend every effort. But there is no need of apology. Fundamentals are abstract. The atomic theory is an abstraction. The law of diminishing returns, the nature of electricity, and character development in a Shakespearean tragedy, are scarcely more tangible.

And, if not in school, where is the coming voter to apprehend these seed ideas? Where, if not in school, is he to discover that whenever the mechanism of government is not doing its work, fundamentally, he is to blame? Where, if not to the school trained man, need we look for anything but a spiritless and easy acceptance of the usurpation of popular sovereignty?

It is no less important to the welfare of the future that the voter shall know his power, than that he shall know the self imposed restraints upon his power. He must realize that ours is a constitutional government.

To bring the student this acquirement, we must specially stress the dynamics of the constitution. The pupil must not come to think of this document as a musty and antiquated scroll, containing a preamble (which may be memorized in a parrot-like way), seven articles, and fifteen amendments. He must come to think of the constitution of the United States as living law, a grant of powers, by means of which he, as one of "We the people" creates and disbands Congresses, elects presidents, and dissolves a monster trust.

Suppose I ask a group of my students who have learned what Congress is, and know what many of its powers are, to tell me in the most general way what congress may do. A large proportion of them will begin to enumerate, "raise revenue, maintain a navy, establish post roads." Another considerable proportion will say: "they may make any laws," or, "they may make any laws which they think will benefit the country." It is only after we have urged it repeatedly, that they appreciate the constitutional powers and limitation of Congress.

Not only because it is a distinctive feature of our government do I believe its constitutional nature should be perceived. In the years immediately to come, it will be, I believe, impossible, to view public questions deeply without such a perception. The initiative and referendum, the recall of minor legislative and executive officers, and the proposed recall of judicial decisions and of presidents, are matters which squarely raise this issue: Can the people create a body which they may trust with certain specified powers? Or must they make each specific piece of work subject to direct and immediate popular revision?

Let us then in our teaching of the powers of the president, turn often to the virile seed from which the "text" has been developed. When we study what Congress may do, let us put our fingers again and again on the clause which says, "We the people," and from that, proceed to the one where "we the people" declare that with our consent, "congress shall have power." And when the courts are our theme, let us show clearly that it is this foundation, written law, that marks the outlines of their jurisdiction.

It will be impossible to stress the rule of the people as a characteristic of American government, and to put emphasis upon the dynamics of the constitution without bringing out strongly another leading feature of our administrative system. This is the three-fold division of powers.

So long as we believe in our present plan of regulation, this cannot be made too clear. I believe that we must not only bring the student to perceive it, but that we must also bring him to feel strongly its uses. We need not stop with pointing out its historical origin. Must we leave it when we have shown that by this scheme, the fathers thought to minimize the chance of dangerous concentration of power? Can we not indicate questions of today whose issue lies in this matter? Are we going too far if we declare that in the very friction of these divided powers, lies perpetual safety. From the clash of wheel on wheel, are struck off the sparks that keep the eyes of the people on the movements of their governmental mechanism.

This three-fold division of powers must be impressed, not alone, because it is important, but because it is typical of every grade of government in the United States.

It is to the student a sort of standard gauge. Once he has comprehended the significance of legislative, executive, and judicial functions, a hundred facts and ideas, heretofore scattered and kinless, tumble into order like an infantry troop at the command, "Fall in." President, governor, sheriff, and mayor snap into the executive column; congress, legislatures, county boards and councils, wheel into the legislative line; while the police magistrate and the supreme justice, are alike uniformed with the judicial power.

But civics will have made but half its rightful offering to the aim of the school, if it merely coldly stamps in these ideas. It must make these matters interesting.

Emphasis upon the *national* government is, I believe, one of the best ways to secure this interest. This may not be true in the largest cities, where municipal civic problems are so terribly tangible. But in most high schools, where striking

material for first hand observation is largely lacking, the study of the national government, in my experience, meets with most response. It is big, stirring and picturesque. It occupies the pages of the press. Its personalities are vigorous. It has the fascinating lure of the big thing, seldom seen.

And in stressing the national government, we will arouse the greatest degree of interest if we vary our emphasis with public circumstances. To stir enthusiasm, we must dwell on the thing most in the air. Last spring the nominating conventions held popular attention, while the elections were still distant. This fall the situation was reversed. Every body talked presidential election and its attendant possibilities. It is with profit that the class can follow the crowd.

Popular interest is not always keen, but every semester has its congressional meeting, its special session, or its significant laws and decisions. Nothing will feed the student's interest more than the feeling that he is "next" to what is going on.

It will not be wise to rely on this point of emphasis alone, to give zest to the work in civics. Every bit of tangible material is added spice. The average high school pupil just as with Helen's babies and their uncle's watch, will see little interest in government unless he "sees the wheels go round." For interest, the work must be vitalized with the concrete.

Trips afield may be impossible in many schools, and take time in any school, but wall display is always possible. Documents and reference books are good, but lack the vivid interest of pictures, clippings, and cartoons. The thing that makes the quick, but accurate appeal is best.

Civics in our high schools will, I believe, rapidly become more and more a laboratory study. We have a right to demand for it conditions where we can present enough vivid, concrete material to stimulate interest, but where that material can be presented with an economy of time and a freedom from extraneous material, that will allow us to exhibit it, not for itself alone, but for the elemental characteristic of American government that it illustrates.

The one semester course on civil government, then, to my mind, should put emphasis upon civil government as a science rather than as a reservoir of information. I believe it best performs its function, when we eliminate the idea that its scope necessarily includes all questions of economics, public ethics, and sociology; and when we subordinate all things not inherently governmental. In my judgment, it will have justified its place on the curriculum if it has quickened in the pupil an interest in public affairs, and has planted deeply in the growing mind the innate qualities of our self government.

Mr. E. S. Dowell continued the discussion of civics as follows:

"In teaching civics the best condition would be a school which could be provided with 3 or 4 copies each of Garner, Forman, Hinsdale, Guitteau, James and Sanford, Bryce, Beards and Schley's texts. If these cannot be obtained the students should have one text and as many of the others as possible. At the beginning of each recitation, the teacher should give 7 or 8 questions on a subject that is to be considered. The teacher should give references for the pages where material can be found for answers, at least the first semester.

"Notebooks should be kept with the questions on one page and the answers as the pupils have found them. On the opposite page the correct answers should be written, after a discussion in class.

"The teacher should collect as much illustrative material as possible and this should be used to clear up points. Every two or three weeks a recitation should be set aside for the discussion of current events.

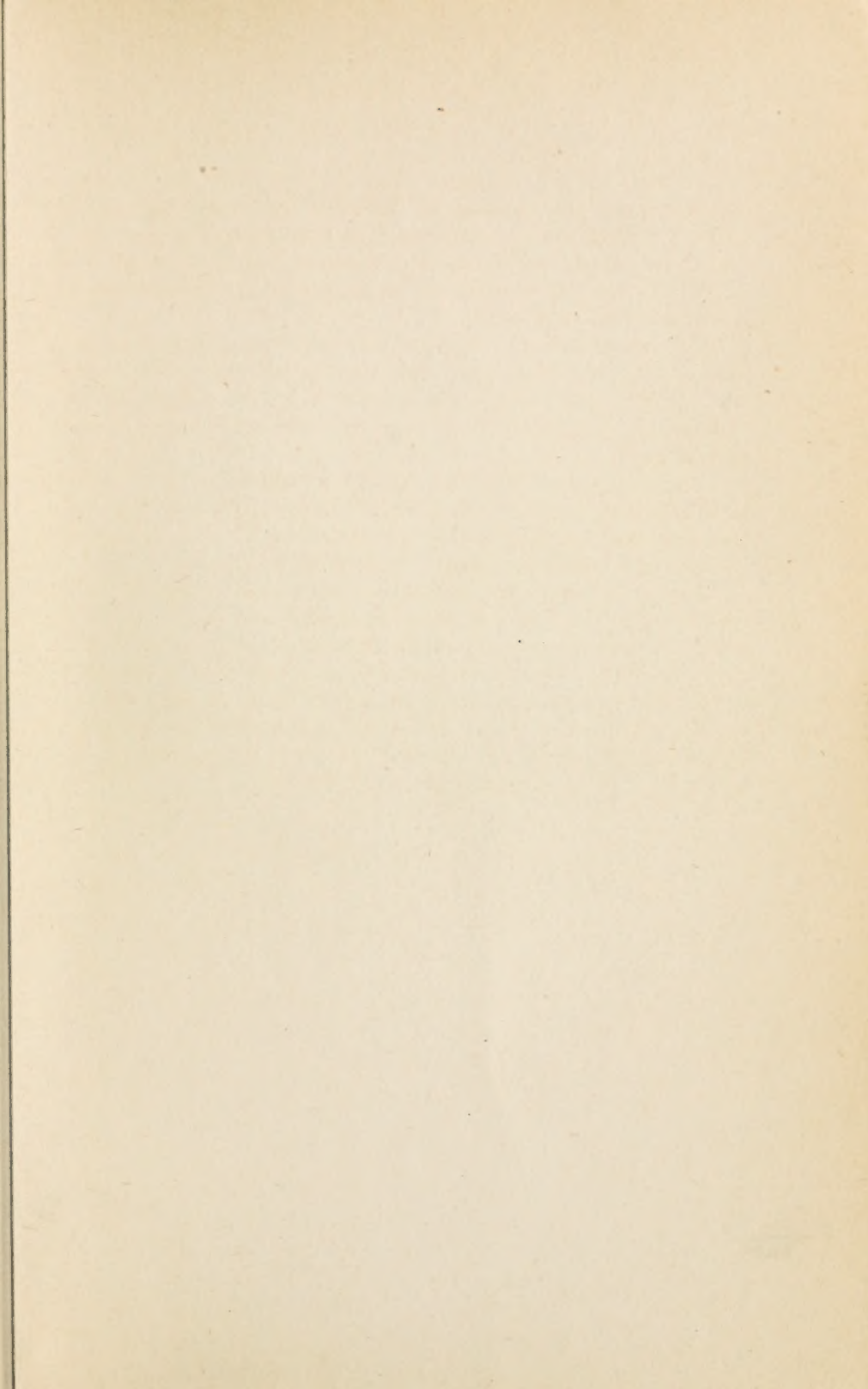
The pupils should be encouraged in reading such of our best papers as the *Outlook* and the *Independent*. Debates five or six times on such subjects as: "The presidential term of six years without re-election," or the "Commission form of city government," should be added. This would show the double sidedness of all political questions and would help in stimulating interest.

"Occasional talks by public men such as mayor, alderman, congressmen, or judge, in explanation of their work will be helpful to the students.

"Field trips to public institutions such as sessions of courts, or council meetings will give the pupil an insight into the actual practises of government.

"Additional reading besides that made for debates, or current events, or in answering the regular questions, is not desirable and only makes the work too burdensome. Civics taught in such a way should make students have a real live interest in governmental affairs."

In the absence of Mr. Echols, Professor Larson reported that the committee on a syllabus of American history had not completed its work. A motion was made and carried that the same committee continue the work. After a discussion as to the number of the edition to be made the matter was left to the committee to decide. A motion was made and carried that a committee be appointed to consider the collection of materials for an exhibit to aid in the teaching of civics and history, to be presented at each Conference.









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